This document gives pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Major, Municipal permit. The discharge results from the operation of an 8.0 MGD wastewater treatment plant with an additional flow tier of 13 MGD. This permit action consists of updating the proposed effluent limits to reflect the current Virginia WQS (effective January 6, 2011) and updating permit language as appropriate. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9VAC25-260 et seq.

1.	Facility Name and Mailing Address:	Little Falls Run WWTF P.O. Box 339 Stafford, VA 22555-0339	SIC Code:	4952 WWTP
	Facility Location:	100 Michael Scott Lane Fredericksburg, VA 22405	County:	Stafford
	Facility Contact Name:	Michael T. Smith Director of Utilities	Telephone Number:	540-658-8633
	Facility E-mail Address:	msmith@staffordcountyva.gov		
2.	Permit No.:	VA0076392	Expiration Date of previous permit:	9/28/2015
	Other VPDES Permits associated with this facility:		VAN020031 (Nutrient General Permit)	
	Other Permits associated with this facility:		Stationary Source Permit Registration #73771	
	E2/E3/E4 Status:	NA		
3.	Owner Name:	Stafford County Board of Supervisors		
	Owner Contact/Title:	Anthony Romanello, County Administrator	Telephone Number:	540-658-8605
	Owner E-mail Address:	aromanello@staffordcountyva.gov		
4.	Application Complete Date:	3/18/2015		
	Permit Drafted By:	Anna Westernik	Date Drafted:	5/11/2015
	Draft Permit Reviewed By:	Doug Frasier	Date Reviewed:	5/12/2015
	Draft Permit Reviewed By:	Alison Thompson	Date Reviewed:	5/26/2015
	Public Comment Period:	Start Date: 7/23/2015	End Date:	8/24/2015

5. Receiving Waters Information: See **Attachment 1** for flow statistics for free flowing waters at the fall line.

Receiving Stream Name:	Rappahannock River	Stream Code:	
Drainage Area at Outfall:	1,650 sq.mi.	River Mile:	3-RPP104.61
Stream Basin:	Rappahannock	Subbasin:	None
Section:	1	Stream Class:	II
Special Standards:	a	Waterbody ID:	VAN-E20E; RA46
7Q10 Low Flow:	Tidal	7Q10 High Flow:	Tidal
1Q10 Low Flow:	Tidal	1Q10 High Flow:	Tidal
30Q10 Low Flow:	Tidal	30Q10 High Flow:	Tidal
Harmonic Mean Flow:	Tidal	30Q5 Flow:	Tidal

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

X	State Water Control Law	X	EPA Guidelines
X	Clean Water Act	X	Water Quality Standards
X	VPDES Permit Regulation		Other
X	EPA NPDES Regulation		

7. Licensed Operator Requirements: Class I

8. Reliability Class: Class I

9. Permit Characterization:

	Private	X	Effluent Limited		Possible Interstate Effect
	Federal	X	Water Quality Limited		Compliance Schedule Required
	State	X	Whole Effluent Toxicity Program Required		Interim Limits in Permit
X	POTW	X	Pretreatment Program Required		Interim Limits in Other Document
X	TMDL	X	e-DMR Participant		

10. **Wastewater Sources and Treatment Description:**

The Little Falls Run Wastewater Treatment Plant began operations in June 1991, replacing Stafford County's Claiborne Run Sewage Treatment Plant. The wastewater treatment system consists of preliminary treatment with mechanical bar screens and grit and grease removal followed by biological treatment with a Schreiber counter-current, low load aeration system with cyclical aeration controls to provide enhanced nutrient removal (Total Nitrogen of 6.0 mg/L and Total Phosphorus of 0.30 mg/L). There are two 4 MGD Schreiber units operating in parallel (only one is functional at this time). The Schreiber process is followed by clarification, lime and alum addition, cloth filters, ultraviolet light disinfection, and post aeration via rip rap in the outfall channel prior to discharge in the Rappahannock River.

On December 20, 2010, a Certificate to Operate (CTO) was issued for the 8.0 MGD treatment plant. Upgrades included installing fine bubble diffusers in the existing biological treatment (in lieu of the current fixed and rotating diffuses); installing new blowers for each treatment train; upgrading existing aerobic digesters by replacing current diffusers with fine bubble diffusers and providing new blowers; construction of four new digesters with fine bubble diffusers and blowers, and installation of a new emergency generator with automatic transfer switches. (See **Attachment 2**).

Storm water discharge at the Little Falls Run WWTF was formerly permitted under VPDES General Permit VAR051420. A site visit conducted by DEQ staff on February 22, 2014 determined that all storm water was returned to the head of the plant for treatment. Hence, the General VPDES Permit for Discharges of Stormwater Associated with Industrial Activity was terminated on March 28, 2015 due to lack of direct discharge.

See **Attachment 3** for the no-exposure certification memo.

See **Attachment 4** for a facility schematic/diagram.

TABLE 1 – OUTFALL DESCRIPTION				
Outfall Number	**Discharge Sources**	**Treatment**	**Design Flow(s)**	**Outfall Latitude/Longitude**
001	Domestic, Commercial, Industrial Wastewater	See Item 10 above	8.0 MGD (13.0 MGD Expansion)	**38° 15' 22"** N **77° 24' 49"** W
The discharge location is identified on the attached USGS topographic map (Fredericksburg Quadrangle; DEQ #182C) (**Attachment 5**).				

11. Sludge Treatment and Disposal Methods:

Sludge is aerobically digested using eight on-site digesters and dewatered with centrifuges. The facility produces a Class B Sludge. Final disposal of the sludge shall be land application through use of a contractor, Synagro Mid-Atlantic.

12. Discharges, Intakes, Monitoring Stations, Other Items in Vicinity of Discharge

TABLE 2 -- RAPPAHANNOCK RIVER DISCHARGES, INTAKES, AND MONITORING STATIONS

Approximate Rappahannock River Mile	Description
113.57	USGS Gaging Station #0166800 (Fredericksburg)
110.57	DEQ Sampling Station 3-RPP110.57 (Current Trend station - bimonthly)
107.99	Discharge – City of Fredericksburg WWTF, VPDES VA0025127, Major-Municipal
107.91	DEQ Sampling Station 3-RPP107.91 (Not currently being sampled)
107.43	Discharge – FMC WWTP, VPDES VA0068110, Major-Municipal
107.49	Tributary with Discharge – Deep Run, Quarles Petroleum – Fredericksburg Bulk Oil Terminal, VPDES VA0029785, Minor-Industrial
107.33	DEQ Sampling Station 3-RPP107.33 (Not currently being sampled)
106.01	DEQ Sampling Station 3-RPP106.01 (Current Ches. Bay station – monthly)
104.53	Discharge – Massaponax STP, VPDES VA0025658, Major-Municipal
104.61	Discharge – Little Falls Run STP, VPDES VA0076392, Major-Municipal
104.47	DEQ Sampling Station 3-RPP104.47 (Not currently being sampled)
103.77	Tributary with Discharge – Ruffins Creek, Culpeper Wood Preservers, VPDES VA0090468, Minor-Industrial
103.77	Tributary with Discharge – Ruffins Pond, Vulcan Construction Materials, VPDES VAG110098, Ready-Mix Concrete GP
99.05	Discharge – Aggregate Industries MAR – Hayfield Sand and Gravel, VPDES VAG840195, Non-Metallic Mineral Mining GP
98.81	DEQ Sampling Station 3-RPP098.81 (Current Ches. Bay station – monthly)
96.5	Industrial Water Supply – VA0087645, SEI Birchwood, Minor-Industrial, 6.6 MGD maximum intake
96.57	Discharge - SEI Birchwood, VA0087645, Minor-Industrial, 1.14 MGD maximum
95.58	Tributary with Discharge – Birchwood Creek- UT , Greenhost Inc., VA0090654, Minor-Industrial, 1.9 MGD maximum
93.52	Discharge – Four Winds Campground, VPDES VA0060429, Minor-Municipal
91.60	Tributary with Discharge – Birchwood Creek, UT, Crops, Inc. – Sealston, VPDES VA0088374, Minor-Industrial
91.55	DEQ Sampling Station 3-RPP091.55 (Current Ches. Bay station – monthly)
91.2	Discharge – Hopyard Farms Wastewater Treatment Plant, VPDES VA0089338, Minor-Municipal
86.65	Tributary with Discharge – Rappahannock River-UT, Haymount WWTF, VPDES VA0089125, Minor-Municipal (not built)
80.19	U.S. Route 301 Bridge at Port Royal
80.19	DEQ Sampling Station 3-RPP080.19 (Current Ches. Bay station – monthly)
64.40	DEQ Sampling Station 3-RPP064.40 (Current Ches. Bay station – monthly)

13. Material Storage:

TABLE 3 - MATERIAL STORAGE

Materials Description	Volume Stored	Spill/Stormwater Prevention Measures
Aluminum Sulfate	6,000 gallons	Spill Kit/Drains to Head of Facility
Magnesium Hydroxide	5,000 gallons	Spill Kit
Polydyne Polymer	1,000 gallons	Spill Kit/Drains to Head of Facility
Diesel Fuel	8,000 gallons	Double Wall Tank/Spill Kit

14. Site Inspection:

Performed by Anna Westernik on March 30, 2015 (see **Attachment 6**).

15. Receiving Stream Water Quality and Water Quality Standards:

a. Ambient Water Quality Data:

This facility discharges directly into the tidal Rappahannock River. The closest downstream DEQ ambient monitoring station, 3-RPP104.47, is located approximately 0.06 miles from Outfall 001. The following is the water quality summary for this segment of the tidal Rappahannock River, as taken from the 2012 Integrated Report:

Class II, Section 1, Special Standard a

DEQ monitoring stations located in this segment of the Tidal Rappahannock River:

- Ambient station 3-RPP104.47, one hundred yards below the Massaponax Wastewater Treatment Facility
- Ambient station 3RPP106.01, located upstream from the Fredericksburg Country Club
- Fish tissue/sediment station 3-RPP107.33

The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory and sufficient excursions above the fish tissue value (TV) for PCBs in fish tissue.

Additionally, excursions above the risk-based tissue screening value (TSV) of 270 parts per billion (ppb) for arsenic (As) in fish tissue was recorded in one species of fish (1 sample) collected in 2006 at monitoring station 3-RPP107.33 (striped bass), noted by an observed effect.

E. coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. A bacteria TMDL for this portion of the Rappahannock River was approved by EPA on 05/05/2008.

The wildlife and aquatic life* uses are considered fully supporting. The Chesapeake Bay TMDL was completed in 2010. The shellfishing use was not assessed.

*Please note: The aquatic life use is listed as not supporting in the Draft 2014 Integrated Report. Assessment of the thirty day mean dissolved oxygen values during the summer season indicates that the open-water aquatic life subuse is not met. This impairment will be addressed by the completed TMDL for the Chesapeake Bay watershed.

b. 303(d) Listed Stream Segments and Total Maximum Daily Loads (TMDLs):

TABLE 4 - 303(d) IMPAIRMENT AND TMDL INFORMATION FOR THE RECEIVING STREAM SEGMENT

Waterbody Name	Impaired Use	Cause	TMDL completed	WLA	Basis for WLA	TMDL Schedule
Impairment Information in the 2012 Integrated Report						
Rappahannock River*	Recreation	*E. coli*	Tidal Rappahannock Bacteria 5/5/2008	2.26E+13 cfu/year E. coli	126 cfu/100ml *E. coli* --- 13 MGD	NA
	Fish Consumption	PCBs	No	--	--	2016

* Please note that in the Draft 2014 Integrated Assessment, the tidal Rappahannock River is listed with a dissolved oxygen impairment for the aquatic life use and open water aquatic life subuse. The dissolved oxygen impairment will be covered by the completed TMDL for the Chesapeake Bay watershed; however, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

Significant portions of the Chesapeake Bay and its tributaries are listed as impaired on Virginia's 303(d) list of impaired waters for not meeting the aquatic life use support goal, and the draft 2012 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report indicates that much of the mainstem Bay does not fully support this use support goal under Virginia's Water Quality Assessment guidelines. Nutrient enrichment is cited as one of the primary causes of impairment. EPA issued the Bay

TMDL on December 29, 2010. It was partially based on the Watershed Implementation Plans developed by the Bay watershed states and the District of Columbia.

The Chesapeake Bay TMDL addresses all segments of the Bay and its tidal tributaries that are on the impaired waters list. As with all TMDLs, a maximum aggregate watershed pollutant loading necessary to achieve the Chesapeake Bay's water quality standards has been identified. This aggregate watershed loading is divided among the Bay states and their major tributary basins, as well as by major source categories (wastewater, urban storm water, onsite/septic agriculture, air deposition). Section 17.e of this fact sheet provides additional information on specific nutrient limitations for this facility to implement the provisions of the Chesapeake Bay TMDL.

The full planning statement is found in **Attachment 7**.

c. Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, the Rappahannock River, is located within Section 1 of the Rappahannock River Basin, and classified as a Class II water.

Class II tidal waters in the Chesapeake Bay and its tidal tributaries must meet dissolved oxygen concentrations as specified in 9VAC25-260-185 and maintain a pH of 6.0-9.0 standard units (S.U.) as specified in 9VAC25-260-50. In the Northern Virginia area, Class II waters must meet the Migratory Fish Spawning and Nursery Designated Use from February 1 through May 31. For the remainder of the year, these tidal waters must meet the Open Water use. The applicable dissolved oxygen concentrations are presented **Attachment 8**.

This discharge segment for the Little Falls Run WWTF is located in the tidal freshwater zone of the Rappahannock River. This zone extends from the fall line of the Rappahannock River to Buoy 37 near Tappahannock. Freshwater, numerical water quality criteria, as opposed to saltwater criteria (excluding dissolved oxygen, pH, temperature, and chlorine), apply to this tidal freshwater zone.

1. Ammonia Criteria:

The Water Quality Criteria for ammonia are dependent on the instream temperature and pH. The 90th percentile temperature and pH values are used because they best represent the critical design conditions of the receiving stream. Baseline 90th percentile pH and temperature values of 7.5 S.U. and 26°C used to calculate the ammonia criteria for the major sewage treatment plants that discharge in the Rappahannock River were derived from weekly samples collected by the City of Fredericksburg Department of Public Works staff at the Mayfield Bypass Bridge during the period of January 1991 through May 1995. This station is located upstream of the outfalls for the City of Fredericksburg WWTF, FMC WWTF, Massaponax WWTF, and the Little Falls Run WWTF.

For this permit reissuance, staff has reevaluated the receiving stream ambient monitoring data for pH and temperature using data collected from DEQ Ambient Monitoring Station 3-RPP104.47 (located approximately 0.06 rivermiles below the Massaponax WWTF Outfall 001) during the period of March 2004 to December 2009. It is staff's best professional judgment that Monitoring Station 3-RPP104.47 is a good representation of the mixing of effluent discharge and stream flow in the tidal freshwater portion of the Rappahannock River. The 90th percentile pH and temperature for the March 2004 to December 2009 period were found to be 7.69 S.U. and 28.33° C. The 90th percentile pH and temperature values calculated for the 2010 permit reissuance from DEQ Ambient Monitoring Station 3-RPP104.47 and used to determine ammonia criteria in the 2010 permit reissuance are 7.6 S.U. and 28° C. No significant differences between the baseline pH and temperature values, the 2010 pH and temperature values, and the 2015 pH and temperature values were found. Hence, the 90th percentile pH and temperature values used to determine ammonia criteria in the 2010 permit reissuance are being carried forward as part of this permit reissuance. A winter default temperature value of 15° C is used to determine ammonia criteria. See **Attachment 9** for the 90th percentile pH and temperature values derived from DEQ Ambient Monitoring Station 3-RPP104.47 data for the period of March 2004 to December 2009 and **Attachment 10** for the ammonia criteria.

The seasonal tiers for the Rappahannock River are November through April and May through October. These tiers, established by the Virginia Institute for Marine Science (VIMS) Model, reflect the division between winter and summer periods relative to the temperature in the Rappahannock River.

2. Hardness-Dependent Metals Criteria:

The Water Quality Criteria for some metals are dependent on the receiving stream's hardness (expressed as mg/L calcium carbonate). The average measured hardness of the Rappahannock River collected from Monitoring Station 3-RPP098.81

in 2003 is 26 mg/L. The average hardness of the effluent from all the major wastewater treatment plants in the upper tidal portion of the Rappahannock River ranges from 50 to 128 mg/L (the average hardness for the Little Falls Run WWTF determined by the EPA Form 2A, Part D data is 128 mg/L). It is intuitive that when the flows from the wastewater treatment plants are near their design flows, the instream hardness will begin to approach that of the hardness from the wastewater treatment plants. Due to the presence of multiple dischargers in the upper tidal portion of the Rappahannock River and the uncertainty of the mixing zones, staff does not feel it is feasible to perform an accurate mass balance between the hardness of the effluent from the wastewater treatment plants and the receiving stream. A hardness value of 50 mg/L, as recommended by DEQ guidance, should adequately estimate the river hardness when the treatment plant flows approach the design flows. This hardness value was used to determine the water quality criteria for metals (**Attachment 10**).

3. Bacteria Criteria:
The Virginia Water Quality Standards at 9VAC25-260-170A state that the following criteria shall apply to protect primary recreational uses in surface waters:

E. coli and enterococci bacteria per 100 ml of water shall not exceed a monthly geometric mean of the following:

	Geometric Mean[1]
Freshwater *E. coli* (N/100 ml)	126
Saltwater and Transition Zone[2] enterococci	35

[1]For a minimum of four weekly samples [taken during any calendar month].
[2]See 9VAC25-260-140 C for freshwater and transition zone delineation

The Freshwater Water Quality/Wasteload Allocation Analysis (**Attachment 8**) details the water quality criteria applicable to the receiving stream.

d. Receiving Stream Special Standards:
The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, the Rappahannock River, is located within Section 1 of the Rappahannock River Basin. This section has been designated with a special standard of a.

According to 9VAC25-260-310.a, Special Standard a applies to all open ocean or estuarine waters capable of propagating shellfish or in specific areas where public or leased private shellfish beds are present, including those waters on which condemnation or restriction classifications are established by the State Department of Health. The fecal coliform bacteria standard is as follows: the geometric mean fecal coliform value for a sampling station shall not exceed an MPN (Most Probable Number) of 14 per 100 milliliters of sample and the 90th percentile shall not exceed 43 for a 5-tube, 3-dilution or 49 for a 3-tube, 3-dilution test. The shellfish are not to be so contaminated by radionuclides, pesticides, herbicides, or fecal material that the consumption of shellfish might be hazardous. This same standard is also contained in 9VAC25-260-160 Fecal Coliform Bacteria; Shellfish Waters. This standard is used for the interpretation of instream monitoring data and not for setting fecal coliform effluent limitations.

e. Threatened or Endangered Species:
The Virginia DGIF Fish and Wildlife Information System Database was searched on March 9, 2015 for records to determine if there are threatened or endangered species in the vicinity of the discharge. The following threatened or endangered species were identified within a 2 mile radius of the discharge: the Atlantic Sturgeon, the Dwarf Wedgemussel, the Upland Sandpiper, the Loggerhead Shrike, the Migrant Loggerhead Shrike, and the Green Floater. The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and protect the threatened and endangered species found near the discharge.

The stream that the facility discharges to is within a reach identified as having an Anadromous Fish Use. It is staff's best professional judgment that the proposed limits are protective of this use.

f. Virginia Institute of Marine Science Rappahannock River Model:
Stafford County, Spotsylvania County and the City of Fredericksburg sponsored a water quality model for the upper Rappahannock River estuary developed by the Virginia Institute for Marine Science, entitled A Modeling Study of the Water Quality of the Upper Rappahannock River (VIMS Model). This model was approved by the State Water Control Board Director on December 6, 1991, and has been used to determine effluent limitations for new and expanded discharges in the upper Rappahannock River since then. The model was initially run on the following dates: August 14, 1995, for the issuance of the Haymount permit and the flow expansion

at the Fredericksburg STP; August 22, 1996, for the issuance of the Hopyard permit; and March 17, 1997, for changes in flow and production at White Packing. It was run again on April 7, 1999, to accommodate flow expansions at the Little Falls Run WWTF and the Massaponax WWTP. Staff ran the VIMS Model in April 2003 for the expansion of the proposed Hopyard WWTP to 0.5 MGD.

Based on the previous runs of Virginia Institute for Marine Science model entitled *A Modeling Study of the Water Quality of the Upper Tidal Rappahannock River*, the chlorophyll a levels in the upper segment of the River in the Fredericksburg area were approaching 100 µg/l. Chlorophyll a serves as an indicator for eutrophication and phosphorus contributes directly to its growth. The limits in the current permit are set to prevent further increases in chlorophyll a concentrations in this segment of the river. Whether or not nutrient limitations are needed for the Bay, the total phosphorus loadings (mass, kg/d) will not be allowed to increase for the City of Fredericksburg, FMC, Massaponax, and Little Falls Run wastewater treatment plants beyond current limits.

With the 2005 reissuance, Stafford County asked for an additional flow tier of 13.0 MGD in the Little Falls Run VPDES permit. Staff used the VIMS Model to evaluate what impact this increased flow would have on the Upper Rappahannock River. The modeling done in 2005 did not result in any changes to the limits proposed in the permit.

In 2009, Spotsylvania County requested that 1.4 MGD flow from the FMC facility be transferred to the Massaponax STP permit. This request created an additional flow tier of 9.4 MGD in the Massaponax permit, but the FMC STP would not be expanded beyond its current design flow of 4.0 MGD. Staff used the VIMS Model to evaluate any potential impact to the River. This minor change also did not require any effluent limits to be changed according to the model. The 2009-2010 modeling summary is found in **Attachment 11.**

The VIMs Model is used in this permit reissuance to calculate limits for carbonaceous biological oxygen demand ($CBOD_5$), Total Kjeldahl Nitrogen (TKN), Dissolved Oxygen (D.O.), and near-field Total Phosphorus (TP).

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream has been classified as Tier 1 because the aquatic life has been listed as not supporting in the Draft 2014 Integrated Report due to dissolved oxygen values for open-water aquatic life subuse not being met.

Additionally, the fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory and sufficient excursions above the fish tissue value (TV) for PCBs in fish tissue, and excursions above the risk-based tissue screening value (TSV) of 270 parts per billion (ppb) for arsenic (As) in fish tissue was recorded in one species of fish (1 sample) collected in 2006 at monitoring station 3-RPP107.33 (striped bass), noted by an observed effect.

These observations indicate that the water quality of the river is not exceptional or exceeding the water quality standards. Permit limits proposed have been established by determining wasteload allocations that will result in attaining and/or maintaining all water quality criteria that apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. In the case of ammonia evaluations, limits are needed if the 97th percentile of the thirty-day average effluent concentration values is greater than the chronic WLA. Effluent limitations are based on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a. Effluent Screening:
The review of the violation summary for the period of September 2010 through Dec 2014 obtained from Discharge Monitoring Reports (DMRs) shows no exceedences of permit limitations. Effluent data obtained from monitoring required by the permit application has been reviewed and determined to be suitable for evaluation. Copper, nickel, and zinc were detected above their respective quantification levels and thus, require determination of a wasteload allocation. The 2015 reissuance file contains the monitoring data required for the reissuance of the permit.

b. Determining Wasteload Allocations:
Acute Toxicity - DEQ-Guidance Memorandum 00-2011 states that for surface discharges into tidal estuaries or estuarine embayments, the acute wasteload allocation WLAa should be set at two times the acute standard because initial mixing in these circumstances is limited and lethality in the allocated impact zone must be prevented. The 2X factor is based upon the acute standard or criteria maximum concentration (CMC) defined as one half of the final acute value (FAV) for a specific toxic pollutant. The FAV prevents acute toxicity 95% of time for the genera tested.

If the acute value is one half the FAV, then two times the acute standard equals the FAV, which is an acceptable value for preventing lethality.

Chronic Toxicity - DEQ-Guidance Memorandum 2011 states that for surface discharges into tidal estuaries, estuarine embayments, or the open ocean, the WLAc should be based upon site specific data on waste dispersion or dilution when available and appropriate. Where wastewater dispersion/dilution data are not available, a dilution ration of 50:1 may be used. While staff acknowledges that some dilution is occurring in the Rappahannock River, it is not appropriate to use the 50:1 dilution ratio. Four major municipal sewage treatment plants discharge into a relatively small tidal freshwater area close to the fall line. Therefore, large tidal influences may not be realized. Recognizing that 50:1 is too high a dilution ratio and no dilution is too stringent (end of pipe) because some mixing is occurring, staff has chosen to use an instream waste concentration of 50% until more evidence becomes available that demonstrates a more appropriate dilution ratio.

Further justification for not using the 50:1 dilution ratio and using the 2X factor to determine chronic wasteload allocations is found by calculating the cumulative Instream Waste Concentration (IWC) of all four Upper Rappahannock Dischargers (Little Falls Run - 13 MGD, Massaponax - 9.4 MGD, Fredericksburg - 4.5 MGD, and FMC -4.0 MGD) at a 7Q10 flow. The flows from all facilities are critical since they all impact the available mixing zone.

$$IWC = \frac{Qe}{Qe + Qs} = \frac{13\ MGD + 9.4\ MGD + 4.5\ MGD + 4.0\ MGD}{(13\ MGD + 9.4\ MGD + 4.5\ MGD + 4.0\ MGD) + 25\ MGD} = 0.55 \quad (55\%)$$

Where: Qe = The combined flows of all four freshwater tidal Rappahannock River dischargers.
Qs = The 7Q10 of the Rappahannock River at Record Gage #0166800 located on the fall line (**See Attachment 1**).

$$IWC = \frac{Qe}{Qe + Qs} = \frac{13\ MGD + 9.4\ MGD + 4.5\ MGD + 4.0\ MGD}{(13\ MGD + 9.4\ MGD + 4.5\ MGD + 4.0\ MGD) + 50\ MGD} = 0.38 \quad (38\%)$$

Where: Qe = The combined flows of all four freshwater tidal Rappahannock River dischargers.
Qs = The 30Q10 of the Rappahannock River at Record Gage #0166800 located on the fall line (**See Attachment 1**).

The IWC at a 7Q10 flow was found to be 55% and the IWC at a 30Q10 flow was found to be 38%; therefore a dilution factor of 2X would adequately protect the stream.

Staff derived wasteload allocations where parameters are reasonably expected to be present in an effluent and where effluent data indicate the pollutant is present in the discharge above quantifiable levels. With regard to the Little Falls Run WWTF Outfall 001 discharge, monitoring data indicate that wasteload allocations be calculated for ammonia because the discharge is from a sewage treatment plant and EPA Form 2A data indicate that copper, nickel and zinc are present in the discharge. See **Attachment 10** for WLA derivations.

1) Ammonia as N/TKN:
Staff reevaluated the effluent pH and has concluded it is not significantly different than what was used previously to derive ammonia criteria and subsequent limits. Therefore, the current monthly average and weekly average ammonia limit of 4.7 mg/L and 5.6 mg/L using a 2.5:1 dilution to derive ammonia WLAs shall remain in the permit at this time throughout the year (see **Attachment 12).**

The VIMS Model shows that monthly average and weekly average TKN limits of 6.0 mg/L and 9.0 mg/L are needed during May through October at both design flow tiers. The VIMS Model shows that neither TKN nor ammonia limits are needed for the high flow period of November through April. The existing TKN May through October limits shall remain in the permit to protect the dissolved oxygen standard.

The Environmental Protection Agency (EPA) finalized new, more stringent ammonia criteria in August 2013; possibly resulting in significant reductions in ammonia effluent limitations. It is staff's best professional judgment that incorporation of these criteria into the Virginia Water Quality Standards is forthcoming. This facility and others may be required to comply with new criteria in this permit term or during their next permit term.

2) Metals/Organics:
Evaluation of the copper, nickel, and zinc data submitted with the permit application indicates that limits are not needed (see **Attachment 12**).

c. Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants:
No changes to D.O., $CBOD_5$, total suspended solids (TSS), TKN, Total Phosphorus (TP), Total Nitrogen (TN), pH, and *E. coli* limitations are proposed within the flow tiers of this permit

Monthly average concentration and loading for Total Phosphorus, Dissolved Oxygen, TKN (May-October), and $CBOD_5$ limitations are based on the VIMS model and are set to meet the water quality criteria for D.O. in the receiving stream. With the 2005 reissuance, Stafford County asked for an additional flow tier of 13.0 MGD in the Little Falls Run VPDES permit. Staff used the VIMS model to evaluate what impact this increased flow would have on the Upper Rappahannock River. The modeling results did not warrant any changes to the above limits at the expanded flow tier.

It is staff's practice to equate the TSS limits with the $CBOD_5$ limits since the two pollutants are closely related in terms of treatment of domestic sewage.

pH limitations are set at the water quality criteria.

E. coli limitations are in accordance with the Water Quality Standards 9VAC25-260-170.

d. Effluent Annual Average Limitations and Monitoring, Outfall 001 – Nutrients
VPDES Regulation 9VAC25-31-220(D) requires effluent limitations that are protective of both the numerical and narrative water quality standards for state waters, including the Chesapeake Bay.

As discussed in Section 15, significant portions of the Chesapeake Bay and its tributaries are listed as impaired with nutrient enrichment cited as one of the primary causes. Virginia has committed to protecting and restoring the Bay and its tributaries. Only concentration limits are now found in the individual VPDES permit when the facility installs nutrient removal technology. The basis for the concentration limits is 9VAC25-40 - *Regulation for Nutrient Enriched Waters and Dischargers within the Chesapeake Bay Watershed,* which requires new or expanding discharges with design flows of $\geq$0.04 MGD to treat for TN and TP to either BNR (Biological Nutrient Removal) levels (TN = 8 mg/L; TP = 1.0 mg/L) or SOA (State of the Art) levels (TN = 3.0 mg/L and TP = 0.3 mg/L).

This facility has also obtained coverage under 9VAC25-820 *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia.* This regulation specifies and controls the nitrogen and phosphorus loadings from facilities and specifies facilities that must register under the general permit. Nutrient loadings for those facilities registered under the general permit as well as compliance schedules and other permit requirements, shall be authorized, monitored, limited, and otherwise regulated under the general permit and not this individual permit. This facility has coverage under this General Permit; the permit number is VAN020031. TN Annual Loads and TP Annual Loads from this facility are found in 9VAC25-720 – *Water Quality Management Plan Regulation,* which sets forth TN and TP maximum wasteload allocations

for facilities designated as significant discharges, i.e., those with design flows of ≥0.5 MGD above the fall line and >0.1 MGD below the fall line.

Monitoring for Nitrates + Nitrites, Total Kjeldahl Nitrogen, TN, and TP are included in this permit. The monitoring is needed to protect the Water Quality Standards of the Chesapeake Bay. Monitoring frequencies are set at the frequencies set forth in 9VAC25-820. Annual average effluent limitations, as well as monthly and year to date calculations, for TN and TP are included in this individual permit.

The Little Falls Run WWTF is currently operating at the 8.0 MGD, Phase I design flow tier. Presently, a 6.0 mg/L Annual Average TN and a 0.30 mg/L Annual Average TP are in the permit at the 8.0 MGD, Phase I design flow tier. The WQIF Grant Agreement (Stafford County Little Falls Run WWTF--Phase I Grant #440-S-09-18) was amended on June 30, 2010 to reflect these concentrations; the design flow of 6.0 MGD indicated in the Certificate to Construct approval letter of July 9, 2009 is no longer in effect (see **Attachment 13**).

At the 8.0 MGD Phase II design flow tier, a 4.0 mg/L Annual Average TN and a 0.30 mg/L Annual Average TP are proposed. These concentrations are based on the values used to derive the WLA contained in 9VAC25-720 – *Water Quality Management Plan Regulation.*

At the 13.0 MGD design flow tier, a 3.0 mg/L Annual Average TN and a 0.30 mg/L Annual Average TP are proposed. These concentrations are based on 9VAC25-40 - *Regulation for Nutrient Enriched Waters and Dischargers within the Chesapeake Bay Watershed* that requires expanding discharges to treat to State-of-the-Art levels (TN = 3.0 mg/l and TP = 0.3 mg/l).

e. Effluent Limitations and Monitoring Summary:

The effluent limitations are presented in the following table. Limits were established for D.O., $CBOD_5$, TSS, TKN, TP, TN, , ammonia, pH and *E. coli.* Monitoring is required for Nitrates + Nitrites and Whole Effluent Toxicity. The mass loading (kg/d) for $cBOD_5$ and TSS monthly and weekly averages were calculated by multiplying the concentration values (mg/L) with the flow values in MGD and a conversion factor of 3.785. The mass loading (lb/d) for TKN monthly and weekly averages were calculated by multiplying the concentration values (mg/L) with the flow values (in MGD) and then a conversion factor of 8.345.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

The VPDES Permit Regulation at 9VAC25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for CBOD and TSS (or 65% for equivalent to secondary). The limits in this permit are water-quality-based effluent limits and result in greater than 85% removal.

18. Antibacksliding:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

19.a Effluent Limitations/Monitoring Requirements:

Design flow is 8.0 MGD (Phase I).

Effective Dates: During the period beginning with the permit effective date and lasting until the permit expiration date, or the issuance of a CTO for either the 8.0 MGD Phase II facility or the 13 MGD facility, whichever occurs first, the permittee is authorized to discharge from Outfall Number 001. Such discharges shall be limited and monitored by the permittee as specified below.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	Continuous	TIRE
pH	1	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
$CBOD_5$ [a]	1, 2	9 mg/L 270 kg/day	14 mg/L 420 kg/day	NA	NA	1/D	24H-C
Total Suspended Solids (TSS) [a, b]	3	9.0 mg/L 270 kg/day	14 mg/L 420 kg/day	NA	NA	1/D	24H-C
TKN (May – Oct)	1, 2, 4	6.0 mg/L 400 lb/day	9.0 mg/L 600 lb/day	NA	NA	1/W	24H-C
TKN (Nov -- April)	1, 2, 4	NL mg/L	NL mg/L	NA	NA	1/W	24H-C
Ammonia as N	1	4.7 mg/L	5.6 mg/L	NA	NA	1/D	24H-C
Dissolved Oxygen (D.O.)	1, 2	NA	NA	6.0 mg/L	NA	1/D	Grab
E. coli (Geometric Mean) [c]	1, 5	126 n/100mL	NA	NA	NA	1/D	Grab
Nitrate+Nitrite, as N	4	NL mg/L	NA	NA	NA	1/W	24H-C
Total Nitrogen [d, e]	4	NL mg/L	NA	NA	NA	1/W	Calculated
Total Nitrogen – Year to Date [d, e]	4	NL mg/L	NA	NA	NA	1/M	Calculated
Total Nitrogen - Calendar Year [d, e]	4	6.0 mg/L	NA	NA	NA	1/YR	Calculated
Total Phosphorus	4	NL mg/L	NA	NA	NA	1/W	24H-C
Total Phosphorus – Year to Date [e]	4	NL mg/L	NA	NA	NA	1/M	Calculated
Total Phosphorus - Calendar Year [e]	4	0.30 mg/L	NA	NA	NA	1/YR	Calculated
Chronic Toxicity – C. dubia (TU_c)	NA	NA	NA	NA	NL	1/YR [f]	24H-C
Chronic Toxicity – P. promelas (TU_c)	NA	NA	NA	NA	NL	1/YR [f]	24H-C

The basis for the limitations codes are:

1. Water Quality Standards
2. VIMs Model (**Attachment 11**)
3. Best Professional Judgment
4. 9VAC25-40 (Nutrient Regulation)
5. Current TMDLs (see Section 15.B .of this Fact Sheet)

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
TIRE = Totalizing, indicating and recording equipment.
S.U. = Standard units.

1/D = Once every day.
1/W = Once every week.
1/M = Once every month.
1/YR = Once every calendar year.

24H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the monitored 24-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of twenty-four (24) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum twenty-four (24) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by 10% or more during the monitored discharge.

Grab= An individual sample collected over a period of time not to exceed 15 minutes.

(a) At least 85% removal for $cBOD_5$ and TSS shall be attained.
(b) TSS shall be expressed as two significant figures.
(c) Samples shall be collected between 10:00 a.m. and 4:00 p.m.
(d) Total Nitrogen = Sum of TKN plus Nitrate+Nitrite.
(e) See Section 20.a. for the calculation of the Nutrient Calculations.
(f) See Part I.D. of the permit for whole effluent toxicity program requirements.

19.b Effluent Limitations/Monitoring Requirements:
Design flow is 8.0 MGD (Phase II).

Effective Dates: During the period beginning with the issuance of the CTO for the 8.0 MGD Phase II facility with enhanced nutrient removal (ENR) and lasting until the permit expiration date or the issuance of the CTO for the 13 MGD facility, whichever occurs first, the permittee is authorized to discharge from Outfall Number 001. Such discharges shall be limited and monitored by the permittee as specified below.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	Continuous	TIRE
pH	1	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
$CBOD_5$ [a]	1, 2	9 mg/L 270 kg/day	14 mg/L 420 kg/day	NA	NA	1/D	24H-C
Total Suspended Solids (TSS) [a, b]	3	9.0 mg/L 270 kg/day	14 mg/L 420 kg/day	NA	NA	1/D	24H-C
TKN (May – Oct)	1, 2, 4	6.0 mg/L 400 lb/day	9.0 mg/L 600 lb/day	NA	NA	1/W	24H-C
TKN (Nov -- April)	1, 2, 4	NL mg/L	NL mg/L	NA	NA	1/W	24H-C
Ammonia as N	1	4.7 mg/L	5.6 mg/L	NA	NA	1/D	24H-C
Dissolved Oxygen (D.O.)	1, 2	NA	NA	6.0 mg/L	NA	1/D	Grab
E. coli (Geometric Mean) [c]	1, 5	126 n/100mL	NA	NA	NA	1/D	Grab
Nitrate+Nitrite, as N	4	NL mg/L	NA	NA	NA	1/W	24H-C
Total Nitrogen [d, e]	4	NL mg/L	NA	NA	NA	1/W	Calculated
Total Nitrogen – Year to Date [d, e]	4	NL mg/L	NA	NA	NA	1/M	Calculated
Total Nitrogen - Calendar Year [d, e]	4	4.0 mg/L	NA	NA	NA	1/YR	Calculated
Total Phosphorus	4	NL mg/L	NA	NA	NA	1/W	24H-C
Total Phosphorus – Year to Date [e]	4	NL mg/L	NA	NA	NA	1/M	Calculated
Total Phosphorus - Calendar Year [e]	4	0.30 mg/L	NA	NA	NA	1/YR	Calculated
Chronic Toxicity – C. dubia (TU_c)	NA	NA	NA	NA	NL	1/YR [f]	24H-C
Chronic Toxicity – P. promelas (TU_c)	NA	NA	NA	NA	NL	1/YR [f]	24H-C

The basis for the limitations codes are:

1. Water Quality Standards
2. VIMs Model (**Attachment 11**)
3. Best Professional Judgment
4. 9VAC25-40 (Nutrient Regulation)
5. Current TMDLs (see Section 15.B .of this Fact Sheet)

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
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S.U. = Standard units.

1/D = Once every day.
1/W = Once every week.
1/M = Once every month.
1/YR = Once every calendar year.

24H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the monitored 24-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of twenty-four (24) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum twenty-four (24) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by 10% or more during the monitored discharge.

Grab= An individual sample collected over a period of time not to exceed 15 minutes.

(a) At least 85% removal for $cBOD_5$ and TSS shall be attained.
(b) TSS shall be expressed as two significant figures.
(c) Samples shall be collected between 10:00 a.m. and 4:00 p.m.
(d) Total Nitrogen = Sum of TKN plus Nitrate+Nitrite.
(e) See Section 20.a. for the calculation of the Nutrient Calculations. The calendar year annual averages for Total Nitrogen and Total Phosphorus are effective January 1st of the year after issuance of the CTO for the new facility/the expanded facility/the installation of nutrient technology.
(f) See Part I.D. of the permit for whole effluent toxicity program requirements.

19.c Effluent Limitations/Monitoring Requirements:
Design flow is 13.0 MGD
Effective Dates: During the period beginning with the issuance of the CTO for the 13.0 MGD flow tier and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	Continuous	TIRE
pH	1	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
$CBOD_5$ [a]	1, 2	9 mg/L 440 kg/day	14 mg/L 690 kg/day	NA	NA	1/D	24H-C
Total Suspended Solids (TSS) [a, b]	3	9.0 mg/L 440 kg/day	14 mg/L 690 kg/day	NA	NA	1/D	24H-C
TKN (May – Oct)	1, 2, 4	6.0 mg/L 650 lb/day	9.0 mg/L 980 lb/day	NA	NA	1/W	24H-C
TKN (Nov -- April)	1, 2, 4	NL mg/L	NL mg/L	NA	NA	1/W	24H-C
Ammonia as N	1	4.7 mg/L	5.6 mg/L	NA	NA	1/D	24H-C
Dissolved Oxygen (D.O.)	1, 2	NA	NA	6.0 mg/L	NA	1/D	Grab
E. coli (Geometric Mean) [c]	1, 5	126 n/100mL	NA	NA	NA	1/D	Grab
Nitrate+Nitrite, as N	4	NL mg/L	NA	NA	NA	1/W	24H-C
Total Nitrogen [d, e]	4	NL mg/L	NA	NA	NA	1/W	Calculated
Total Nitrogen – Year to Date [d, e]	4	NL mg/L	NA	NA	NA	1/M	Calculated
Total Nitrogen - Calendar Year [d, e]	4	3.0 mg/L	NA	NA	NA	1/YR	Calculated
Total Phosphorus	4	NL mg/L	NA	NA	NA	1/W	24H-C
Total Phosphorus – Year to Date [e]	4	NL mg/L	NA	NA	NA	1/M	Calculated
Total Phosphorus - Calendar Year [e]	4	0.30 mg/L	NA	NA	NA	1/YR	Calculated
Chronic Toxicity – C. dubia (TU_c)	NA	NA	NA	NA	NL	1/3M [f]	24H-C
Chronic Toxicity – P. promelas (TU_c)	NA	NA	NA	NA	NL	1/3M [f]	24H-C

The basis for the limitations codes are:

1. Water Quality Standards
2. VIMs Model (**Attachment 11**)
3. Best Professional Judgment
4. 9VAC25-40 (Nutrient Regulation)
5. Current TMDLs (see Section 15.B .of this Fact Sheet)

MGD = Million gallons per day.
NL = No limit; monitor and report.
NA = Not applicable.
TIRE = Totalizing, indicating and recording equipment.
S.U. = Standard units.

1/D = Once every day.
1/W = Once every week.
1/M = Once every month.
1/YR = Once every calendar year.
1/3M = Once every three months.

24H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the monitored 24-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of twenty-four (24) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum twenty-four (24) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by 10% or more during the monitored discharge.

Grab= An individual sample collected over a period of time not to exceed 15 minutes.

(a) At least 85% removal for $cBOD_5$ and TSS shall be attained.
(b) TSS shall be expressed as two significant figures.
(c) Samples shall be collected between 10:00 a.m. and 4:00 p.m.
(d) Total Nitrogen = Sum of TKN plus Nitrate+Nitrite.
(e) See Section 20.a. for the calculation of the Nutrient Calculations. The calendar year annual averages for Total Nitrogen and Total Phosphorus are effective January 1st of the year after issuance of the CTO for the new facility/the expanded facility/the installation of nutrient technology.
(f) See Part I.D. of the permit for whole effluent toxicity program requirements.

20. Other Permit Requirements:

a. Part I.B. of the permit contains quantification levels and compliance reporting instructions:
9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

The calculations for the Nitrogen and Phosphorus parameters shall be in accordance with the calculations set forth in 9VAC25-820 *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia.* §62.1-44.19:13 of the Code of Virginia defines how annual nutrient loads are to be calculated; this is carried forward in 9VAC25-820-70. As annual concentrations (as opposed to loads) are limited in the individual permit, these reporting calculations are intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits.

b. Permit Section Part I.C, details the requirements of a Pretreatment Program:
The VPDES Permit Regulation at 9VAC25-31-210 requires monitoring and 9VAC25-31-220.D requires all discharges to protect water quality. The VPDES Permit Regulation at 9VAC25-31-730 through 900., and the Federal Pretreatment Regulation at 40 CFR Part 403 requires POTWs with a design flow of >5.0 MGD and receiving from Industrial Users (IUs) pollutants that pass through or interfere with the operation of the POTW or are otherwise subject to pretreatment standards to develop a pretreatment program.

The Little Falls Run WWTF is a POTW with a current design capacity of 8.0 MGD. The Pretreatment Program for Stafford County was originally approved January 3, 1996. One Significant Industrial User (SIU) discharges to the Little Falls Run Collection System through this program. Colonial Circuits is a categorical industrial user (CIU) that is regulated by 40 CFR 433 as a metal finisher and Stafford County local ordinances; the discharger is subject to categorical pretreatment standards and local limits.

The pretreatment program conditions in the proposed permit reissuance will include implementation of the approved pretreatment program that complies with the Clean Water Act, the State Water Control Law, state regulations, and local ordinances.

c. Permit Section Part I.D, details the requirements for Whole Effluent Toxicity Program:
The VPDES Permit Regulation at 9VAC25-31-210 requires monitoring and 9VAC25-31-220.I, requires limitations in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. A WET Program is imposed for municipal facilities with a design rate >1.0 MGD, with an approved pretreatment program or required to develop a pretreatment program, or those determined by the Board based on effluent variability, compliance history, IWC, and receiving stream characteristics.

The Little Falls Run WWTF meets two of the above requirements: it is a POTW with a design flow >1.0 MGD and it has an approved pretreatment program. The test protocol uses bioassay-testing methods in measuring the potential for the effluent to cause toxicity in the receiving stream. This permit reissuance includes WET language that requires the Little Falls Run WWTF to perform annual chronic toxicity testing for the duration of the permit. Results are to be reported on the DMR annually at the 8.0 MGD design flow tier. When the Certificate to Operate is issued for the 13 MGD design flow tier, quarterly acute and chronic toxicity testing must commence in accordance in Part I.D. of the permit.

21. Other Special Conditions:

a. **95% Capacity Reopener.** The VPDES Permit Regulation at 9VAC25-31-200.B.4 requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. This facility is a POTW.

b. **Indirect Dischargers.** Required by VPDES Permit Regulation, 9VAC25-31-200 B.1 and B.2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

c. **O&M Manual Requirement.** Required by the Code of Virginia at §62.1-44.19; the Sewage Collection and Treatment Regulations at 9VAC25-790; and the VPDES Permit Regulation at 9VAC25-31-190.E. The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

d. **CTC, CTO Requirement.** The Code of Virginia at § 62.1-44.19 and the Sewage Collection and Treatment Regulations at 9VAC25-790 require that all wastewater treatment works obtain a Certificate to Construct prior to commencing construction and to obtain a Certificate to Operate prior to commencing operation of the treatment works.

e. **Licensed Operator Requirement.** The Code of Virginia at §54.1-2300 et seq., the VPDES Permit Regulation at 9VAC25-31-200 C, and the Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals Regulations at 18VAC160-20-10 et seq. requires licensure of operators. This facility requires a Class I operator.

f. **Reliability Class.** The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet a Reliability Class of I.

g. **Water Quality Criteria Reopener.** The VPDES Permit Regulation at 9VAC25-31-220 D requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.

h. **Nutrient Offsets**. The Virginia General Assembly, in their 2005 session, enacted a new Article 4.02 (Chesapeake Bay Watershed Nutrient Credit Exchange Program) to the Code of Virginia to address nutrient loads to the Bay. Section 62.1-44.19:15 sets forth the requirements for new and expanded dischargers, which are captured by the requirements of the law, including the requirement that non-point load reductions acquired for the purpose of offsetting nutrient discharges be enforced through the individual VPDES permit.

i. **E3/E4.** 9VAC25-40-70 B authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by Subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.

j. **Nutrient Reopener.** 9VAC25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9VAC25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

k. **Mixing Zone Study**. The permittee may conduct a site specific mixing zone study for the receiving waters to determine wasteload allocations for toxic pollutants. The permittee may request that the permit be modified to reflect the results of the study.

l. **PCB Pollutant Minimization Plan.** This special condition requires the permittee, upon notification from DEQ-NRO, to submit a Pollutant Minimization Plan (PMP) to identify known and unknown sources of low-level PCBs in the effluent. This special condition details the contents of the PMP and also requires an annual report on progress to identify sources.

m. **TMDL Reopener.** This special condition is to allow the permit to be reopened, if necessary, to bring it into compliance with any applicable TMDL that may be developed and approved for the receiving stream.

22. Permit Section Part II.

Required by VPDES Regulation 9VAC25-31-190, Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Permit Section Part III.

Permit Section Part III. Part III of the permit contains conditions and requirements for the monitoring and distribution of biosolids. The VPDES Permit Regulation at 9VAC25-31-420 through 729 establishes the standards for the use or disposal of biosolids; specifically land application and surface disposal promulgated under 40 CFR Part 503. Standards consist of general requirements, pollutant limits, management practices and operational standards. Furthermore, the VPA Regulation at 9VAC25-32-303 through 685 sets forth the requirements pertaining to Class B biosolids. The permit sets forth the parameters to be monitored, monitoring frequencies, sampling types, the Biosolids Management Plan and reporting requirements.

24. Changes to the Permit from the Previously Issued Permit:

a. Special Conditions:
1) The Sludge Use and Disposal and the Sludge Reopener Special Conditions have been removed. These special conditions are now covered under Part III of the permit.

b. Monitoring and Effluent Limitations:
1) The 4.0 MGD Design Flow tier has been removed from this permit.
2) To retain consistency with the other Rappahannock Majors, this permit reissuance does not utilize a percentage of freshwater 1Q10 flow in determining wasteload allocations and hence, permit limits. In 2010, freshwater flow was used in the determination of the WLAs for the Little Falls Run WWTF.
3) A 2:1 dilution was used to derive ammonia WLAs in lieu of a 2:5 dilution. However, the current ammonia limits shall remain in the permit.

c. Other:
1) Permit Part III has been added. It sets forth the conditions and requirements for producing, monitoring, and distributing Class B Biosolids.

25. Variances/Alternate Limits or Conditions:

On March 13, 2012, this facility requested and received a waiver for analysis of dissolved metals in lieu of total recoverable metals.

26. Public Notice Information:

First Public Notice Date: 7/23/2014 Second Public Notice Date: 7/30/2015

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3837, anna.westernik@deq.virginia.gov. See **Attachment 14** for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

27. Additional Comments:

Board Action: Stafford County was referred to DEQ Enforcement on October 22, 2014 for sanitary sewer overflows from both the Little Fall Run WWTF and the Aquia WWTF collection systems. The draft consent order was signed by the Stafford County administrator on May 26, 2015 and was placed in public notice on June 29, 2015. See **Attachment 15** for the Schedule of Compliance pertaining to this order.

Staff Comments: On March 9, 2015, the Threatened and Endangered Species Coordination Form and the Threatened and Endangered Species Search was sent to the Virginia Department of Game and Inland Fisheries (VDGIF). The following is the response in part from Ernie Aschenbach, Environmental Services Biologist with VDGIF.

> According to our records, the Rappahannock River is designated a Threatened and Endangered Species Water for the state endangered green floater mussel. The receiving reach of the river is tidal freshwater.
>
> Provided adherence to the effluent characteristics and permit conditions, we do not anticipate the re-issuance of this permit to result in adverse impact to resources under our purview.

On March 11, 2015, the Threatened and Endangered Species Coordination Form and the Threatened and Endangered Species Search was sent to the Department of Conservation and Recreation (DCR). The following is the response in part from Alli Baird, Coastal Zone Locality Liaison with DCR.

> To minimize impacts to aquatic resources, DCR recommends the use of UV/ozone to replace chlorination disinfection and utilization of new technologies as they become available to improve water quality.
>
> Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.
>
> There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

See **Attachment 16** for a complete summary of responses.

Public Comment: No comments were received during the public notice period.

List of Attachments

Attachment 1	Flow Frequency Information
Attachment 2	CTO Dated December 20, 2010
Attachment 3	Storm Water No-Exposure Certification Memo
Attachment 4	Facility Schematic/Diagram
Attachment 5	Fredericksburg Quadrangle Map Topographic Map (182C)
Attachment 6	Site Inspection Memorandum Dated March 30, 2015
Attachment 7	Planning Statement
Attachment 8	Dissolved Oxygen Water Quality Criteria
Attachment 9	90^{th} Percentile Calculations for pH and Temperature at Monitoring Station 3-RPP104.47
Attachment 10	Water Quality Criteria and Wasteload Allocation Calculations
Attachment 11	VIMs Model Summary Dated March 2010
Attachment 12	Limitations Calculated Based on Water Quality Standards
Attachment 13	CTC Dated July 9, 2009
Attachment 14	Public Notice
Attachment 15	Schedule of Compliance for the 2015 Consent Order
Attachment 16	Threatened and Endangered Species Coordination Responses

March 26, 2010
MEMORANDUM

TO: VPDES Reissuance File VA0076392

FROM: Alison Thompson

SUBJECT: Flow Frequency Determination of VPDES Permit No. VA0076392
Little Falls Run WWTP

COPIES:

The Flow Frequency determination for Little Falls Run WWTP's outfall on the Rappahannock River was last conducted in 1998. The determination was carried forward during the 2005 reissuance. Since that time, the data at the continuous record gage on the Rappahannock River near Fredericksburg, VA (#01668000) has been updated and now includes the 30Q10 determination. In 1998 the flow frequencies at the outfall location were determined using values at the Rappahannock River site (#01668000) and adjusting them by proportional drainage areas. The Rappahannock River near Fredericksburg, VA measurement site has a 1596 sq. mi. drainage area; the drainage area at the outfall is 1650 sq.mi. These flow figures are used for determining the Instream Waste Concentration for the significant dischargers in the upper tidal Rappahannock River and approximating the dilution factors to be used to determine the WLAs for metals, organics, and Ammonia as N.

Rappahannock River near Fredericksburg, VA (#01668000)

Drainage area	=	1596 sq. mi.
1Q10	=	38 cfs
7Q10	=	46 cfs
30Q5	=	124 cfs
30Q10	=	78 cfs
High flow 1Q10	=	303 cfs
High flow 7Q10	=	359 cfs
High flow 30Q10	=	494 cfs
HM	=	463 cfs

Rappahannock River at the discharge point

Drainage area	=	1650 sq. mi.	
1Q10	=	39 cfs	25 MGD
7Q10	=	47.6 cfs	31 MGD
30Q5	=	128 cfs	83 MGD
30Q10	=	81 cfs	52 MGD
High flow 1Q10	=	313 cfs	202 MGD
High flow 7Q10	=	371 cfs	240 MGD
High flow 30Q10	=	511cfs	330 MGD
HM	=	479 cfs	309 MGD

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703) 583-3800 Fax (703) 583-3821
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

December 20, 2010

Stafford County
Little Falls Run WWTF
VPDES Permit No.
VA0076392

Mr. Harry Critzer, Director
Stafford County Dept. of Utilities
P. O. Box 339
Stafford, VA 22555

Dear Mr. Critzer:

Enclosed is the Certificate to Operate (CTO) for the above mentioned facility. This action is in accordance with the Virginia *Sewage Collection and Treatment Regulations.*

If you have any questions regarding the CTO, please feel free to contact this office.

Sincerely,

J. S. Desai, P. E.
CBP/Wastewater Engineering
Northern Regional Office

Attachment 2
Attachment 2

COMMONWEALTH of VIRGINIA

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Regional Director

CERTIFICATE TO OPERATE

Owner: Stafford County Department of Utilities

Facility/System Name: Little Falls Run Wastewater Treatment Facility

VPDES Permit Number: VA0076392

Description of the Facility/System:

The project consists of installing fine bubble diffusers in the existing biological treatment (in lieu of the current fixed and rotating diffuses); new blowers for each treatment train; upgrading existing aerobic digesters by replacing current diffusers with fine bubble diffusers and providing new blowers; construction of four (4) new digesters with fine bubble diffusers and blowers, and installation of a new emergency generator with ATS. The project is designed to comply with average monthly effluent limits of 9 mg/l cBOD5; 9 mg/l TSS; Ammonia-N of 4.7 mg/l; pH range of 6.0-9.0 S.U.; 126 n/100 ml E. coli (geometric mean); and a minimum DO of 6.0 mg/l. Additionally, the project is designed to meet an annual average total nitrogen concentration of 6.0 mg/l and an annual average total phosphorus concentration of 0.3 mg/l.

Authorization to Operate: The owner's consulting engineer has certified in writing by letter dated November10, 2010, that the installation has been constructed as per the approved plans and specifications. Therefore, the owner has authorization to operate the 8.0 MGD facility.

ISSUANCE:

J. S. Desai, P. E.
CBP/Wastewater Engineering

Date: December 20, 2010

MEMORANDUM

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHERN REGIONAL OFFICE

13901 Crown Court Woodbridge, VA 22193

SUBJECT: Little Falls Run Wastewater Treatment Facility (VAR051420)

TO: File

FROM: Susan Mackert

DATE: February 25, 2014

COPIES: Ms. Janet L. Spencer – Stafford County
Mr. Brian Green – Little Falls Run Wastewater Treatment Facility

A site visit was performed on February 25, 2014, to assess drainage patterns, point source discharge locations, and permit applicability for the referenced facility.

General Site Observations

- The facility operates under SIC Code 4952 (wastewater treatment) which falls under Sector T – Treatment Works of the Virginia Pollutant Discharge Elimination System (VPDES) General Permit for Storm Water Discharges Associated with Industrial Activity.
- The facility is an advanced wastewater treatment plant with a design flow of 4 MGD which receives flow from domestic, commercial, and light industrial sources.
- The facility comprises approximately 39.995 acres with paved surfaces and consists of an office area and typical wastewater treatment process units (photos 1 – 2).
- All storm water from the facility is collected and returned to the headworks of the wastewater treatment plant:
  - Drains are located under all dumpsters which return storm water back to the headworks (photos 3 - 4).
  - A trench drain located at the solids handling facility returns all storm water back to the headworks (photo 5).
- There is no point source discharge of storm water from the facility.

Staff Recommendations

The requirements found within 9VAC25-151 are applicable to point source storm water discharges associated with industrial activity. Based on observations made during the site visit, it is staff's best professional judgement that there is no reasonable potential for the industrial activity at Little Falls Run Wastewater Treatment Facility to impact storm water quality as all storm water runoff is collected and returned to the headworks of the wastewater treatment plant thereby not creating a point source discharge. Additionally, EPA Storm Water Program Question and Answer Document (#1), specifically states that if a facility discharges its storm water into the headworks of the treatment plant, it is essentially the same as discharging to a combined system or to a sanitary system and is therefore exempt from the requirements of 40 CFR Part 122.26(c).

The facility maintains coverage under the VPDES General Permit for Storm Water Discharges Associated with Industrial Activity (VAR051420). Facility staff indicated their desire to terminate permit coverage should a no-exposure certification be accepted. Pursuant to 9VAC25-151-50 C, an owner covered by the VPDES General Permit for Storm Water Discharges Associated with Industrial Activity who is later able to file a no-exposure certification to be excluded from permitting is no longer authorized by nor required to comply with this permit. Additionally, if the owner is no longer required to have permit coverage due to a no-exposure exclusion, the owner is not required to submit a notice of termination. Please note that if the permit is terminated and a discharge arises in accordance with 9VAC25-31-100, Application for a Permit, Little Falls Run Wastewater Treatment Facility shall be responsible for complying with Virginia State Water Control Law and Regulations. Additionally, coverage may be necessary at a later date should changes to regulations be implemented or site activities change.

Attachment 3

Photo 1. General overview of wastewater treatment plant area. Note paved surfaces.

Photo 2. General overview of wastewater treatment plant area. Note paved surfaces.

Photo 3. Typical drain which is located under all dumpsters returning storm water flow to the headworks of the wastewater treatment plant.

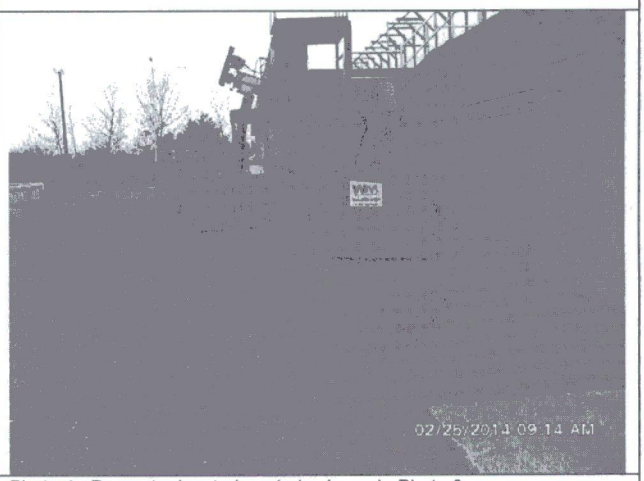
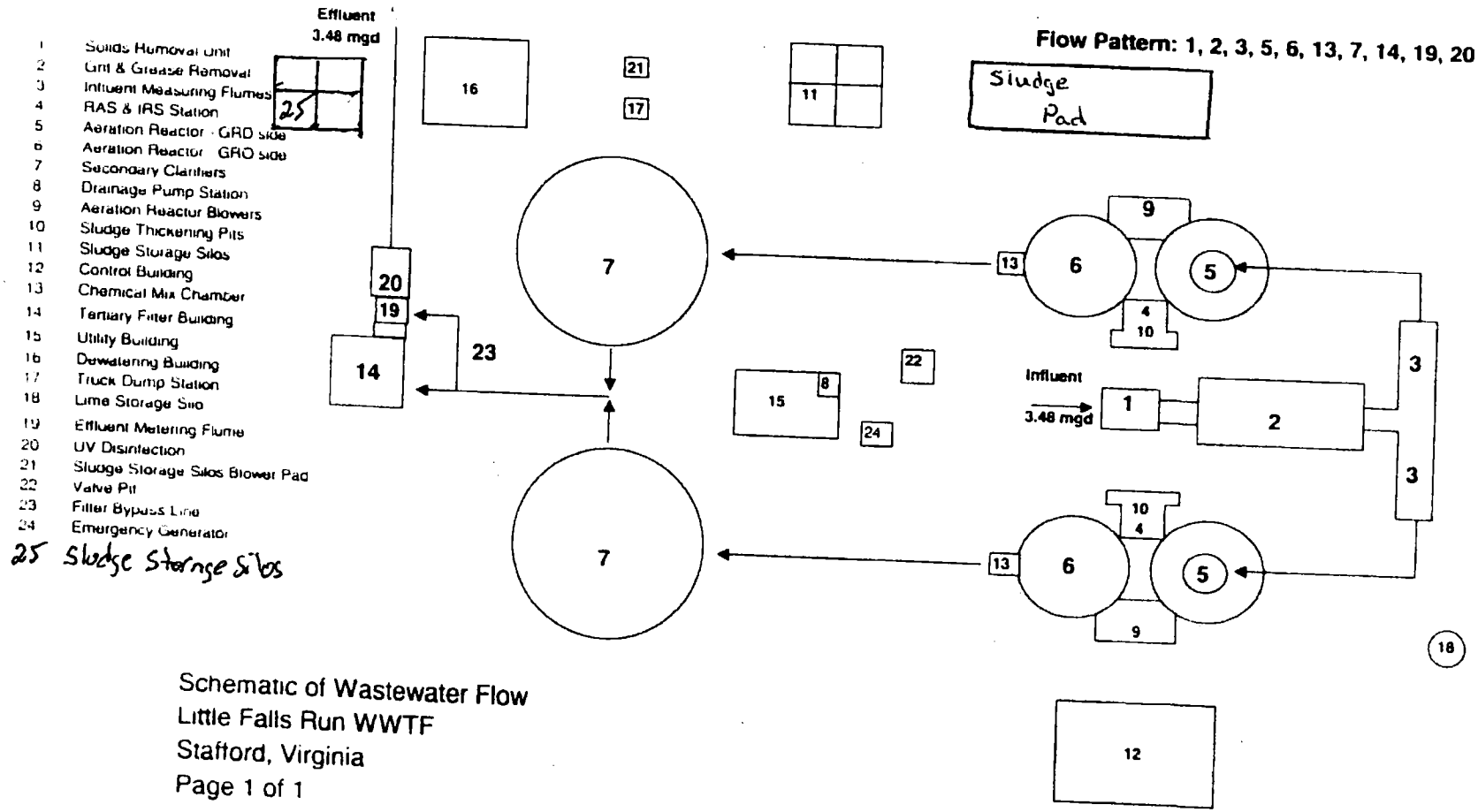


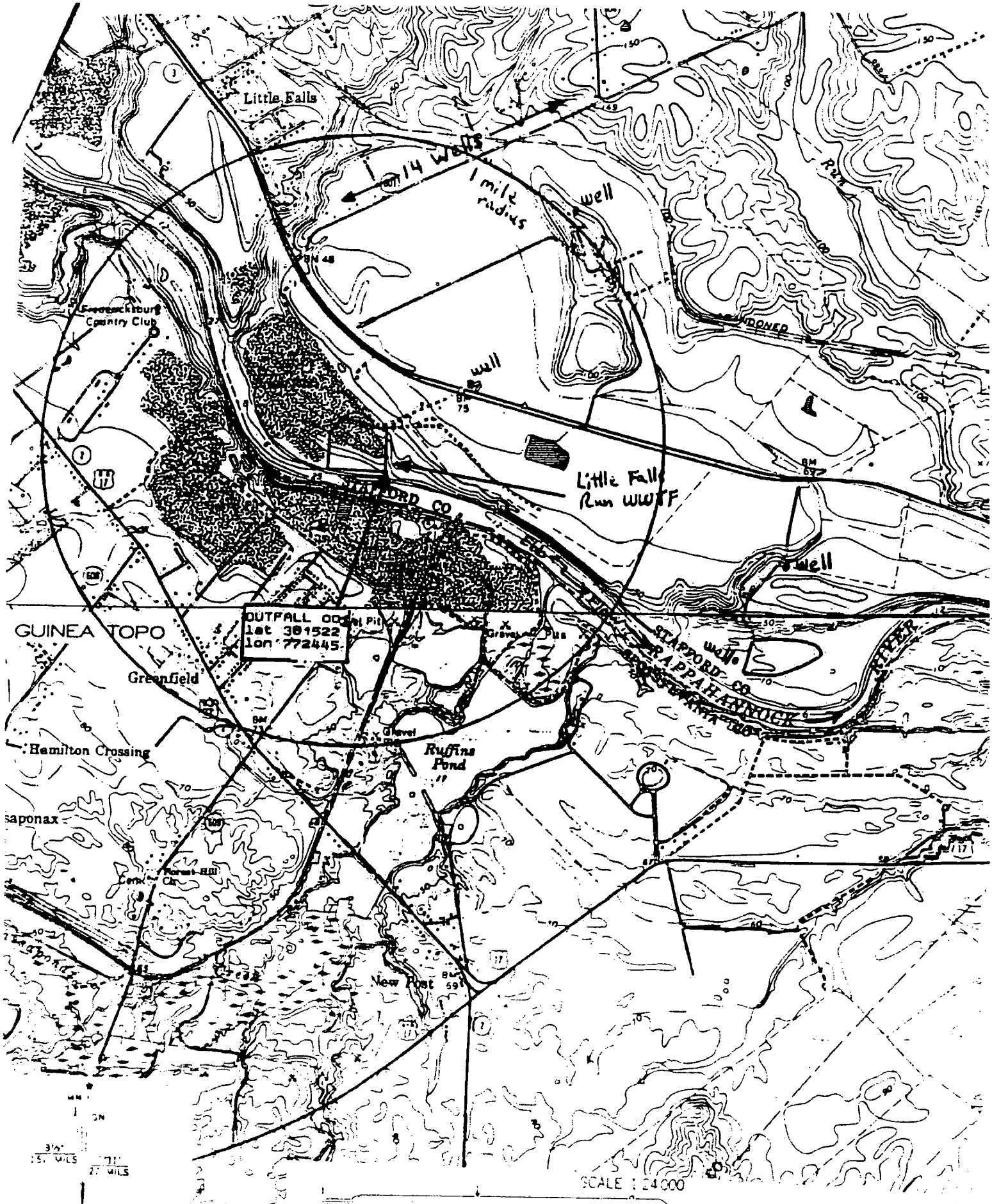
Photo 4. Dumpster located on drain shown in Photo 3.

Photo 5. Trench drain at solids handling facility which returns storm water flow to the headworks of the wastewater treatment plant.



Schematic of Wastewater Flow
Little Falls Run WWTF
Stafford, Virginia
Page 1 of 1

Attachment 4



Attachment 5

VIRGINIA DEPARTMENT OF
ENVIRONMENTAL QUALITY

MEMORANDUM

Northern Regional Office

TO: File

FROM: Anna Westernik, Water Permit Writer

DATE: April 1, 2015

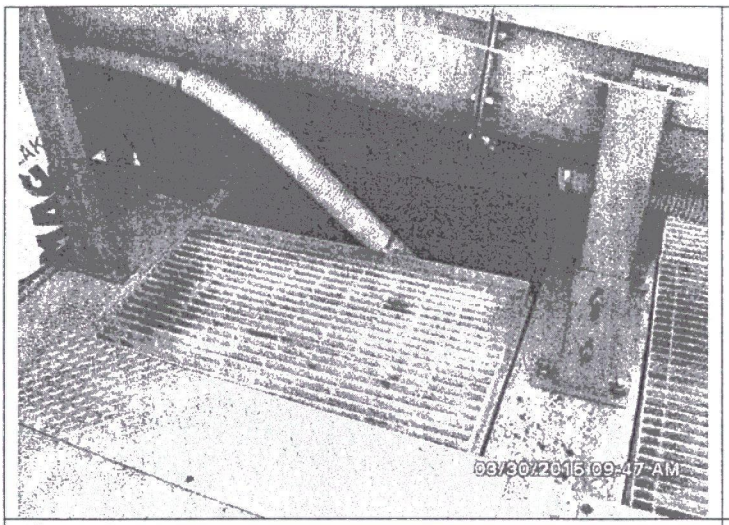
SUBJECT: March 30, 2015 Site Inspection of the Little Falls Run WWTF (VA0076392)

A site visit was made to the Little Falls Run WWTF on March 30, 2015 for the purpose of touring the facility prior to reissuing the permit. Individuals present during the inspection were Brian Green from Stafford County and me.

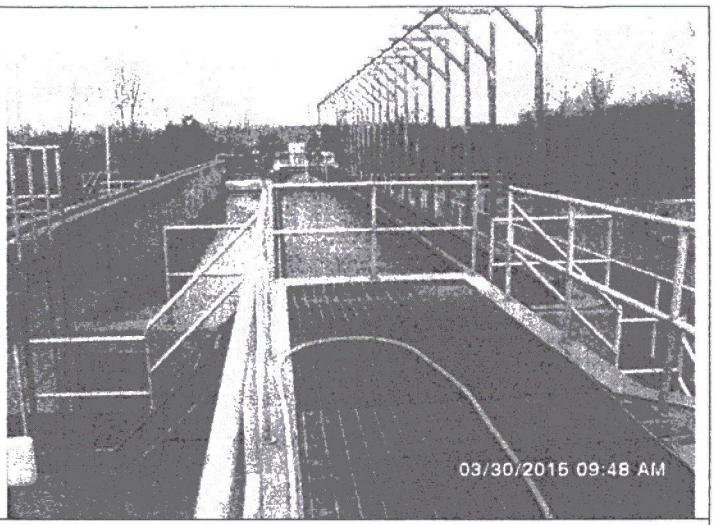
The Little Falls WWTF is rated at a design flow of 8 MGD (the CTO for Phase I of the 8 MGD facility was issued on December 20, 2010) with a planned expansion to 13 MGD. On the day of this visit, the plant was discharging approximately 4.4 MGD of effluent. Wastewater treatment for this 8 MGD plant consists of primary treatment with two bar screens and grit removal, secondary treatment with a denitrification zone, secondary clarifiers, filtration, ultraviolent (UV) disinfection, and post aeration.

Influent solids arriving from the collection system are removed by two automatic bar screens that alternate operation and grit removal. All solids are sent to the landfill for disposal. Primary treated wastewater is sent to secondary treatment where it is denitrified and aerated. All wastewater from secondary treatment travels through two cloth filters operating in series. The filters are cleaned annually with a chlorine based solution; all wastewater from cleaning is returned to the head of the plant for treatment. After filtration, the effluent is disinfected via UV. Three UV trains are present on site. All are operational; however, the operation is alternated among the trains. Wipers and Aquagel are used on the bulbs to ensure proper operation. Currently, the dose is 63%. Effluent from the UV system is discharged to the Rappahannock River via cascade aeration. The Massaponax WWTF discharges on the other side of the Rappahannock River—directly across from the Little Falls Run WWTF.

Approximately 45,000 gpd of sludge from the aeration basins is wasted into a thickening pit and stabilized on site using eight aerobic digesters that function at 50% capacity; sludge from the digesters is placed in a three sided covered drying bed. All Class B biosolids are land applied by Synagro.



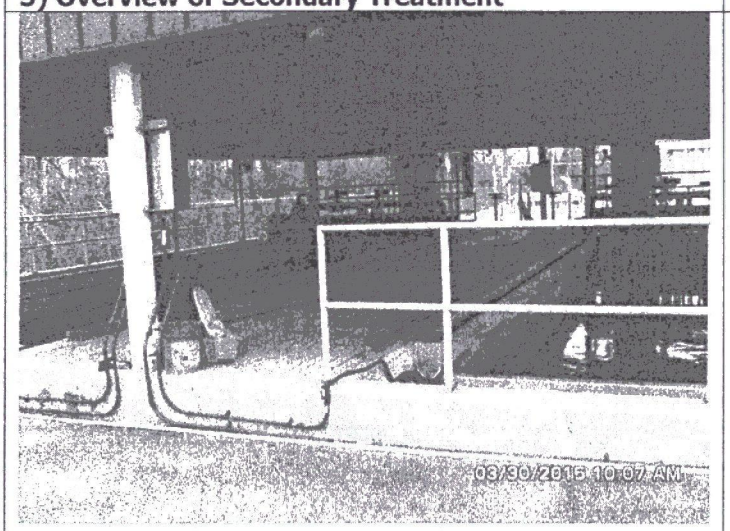
1)Bar Screen



2) Grit Removal

3) Overview of Secondary Treatment

4) Sludge Thickening Area



5) Filter Building

6) Outfall 001 (Prior to Cascade Aeration)

Facility name: The Little Falls Run WWTP
Site Inspection Date: 3/30/2015

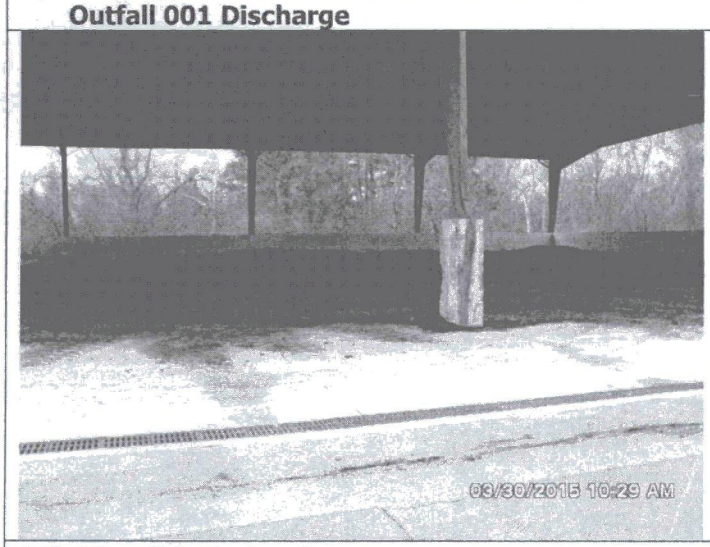
VPDES Permit No. VA0076392
Photos & Layout by: Anna Westernik

7) Outfall 001 Discharging into the Rappahannock River

8) The Rappahannock River in the Outfall 001 Discharge Area

9) The Rappahannock River Downstream from the Outfall 001 Discharge

10) The Massaponax WWTF Discharge in the Rappahannock River



11) Biosolids Drying Area

To:	Anna Westernik
From:	Jennifer Carlson
Date:	May 11, 2015
Subject:	Planning Statement for the Little Falls Run WWTF
Permit Number:	VA0076392

Information for Outfall 001:
Discharge Type: Municipal
Discharge Flow: 8.0 MGD with an expansion to 13 MGD
Receiving Stream: Rappahannock River
Latitude / Longitude: 38° 15' 22" -77° 24' 49"
Rivermile: 104.61
Streamcode: 3-RPP
Waterbody: VAN-E20E; RA46
Water Quality Standards: Class II, Section 1, special standard a
Drainage Area: 1649 mi^2

1. Please provide water quality monitoring information for the receiving stream segment. If there is not monitoring information for the receiving stream segment, please provide information on the nearest downstream monitoring station, including how far downstream the monitoring station is from the outfall.

   This facility discharges directly into the tidal Rappahannock River. The closest downstream DEQ ambient monitoring station, 3-RPP104.47, is located approximately 0.06 miles from Outfall 001. The following is the water quality summary for this segment of the tidal Rappahannock River, as taken from the 2012 Integrated Report:

   Class II, Section 1, special stds. a.

   DEQ monitoring stations located in this segment of the Tidal Rappahannock River:
   - *Ambient station 3-RPP104.47, one hundred yards below the Massaponax Wastewater Treatment Facility*
   - *Ambient station 3RPP106.01, located upstream from the Fredericksburg Country Club*
   - *Fish tissue/sediment station 3-RPP107.33*

   The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control. PCB fish consumption advisory and sufficient excursions above the fish tissue value (TV) for PCBs in fish tissue.

   Additionally, excursions above the risk-based tissue screening value (TSV) of 270 parts per billion (ppb) for arsenic (As) in fish tissue was recorded in one species of fish (1 sample) collected in 2006 at monitoring station 3-RPP107.33 (striped bass), noted by an observed effect.

   E. coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. A bacteria TMDL for this portion of the Rappahannock River was approved by EPA on 05/05/2008.

   The wildlife and aquatic life uses are considered fully supporting. The Chesapeake Bay TMDL was completed in 2010. The shellfishing use was not assessed.*

   *Please note: The aquatic life use is listed as not supporting in the Draft 2014 Integrated Report. Assessment of the thirty day mean dissolved oxygen values during the summer season indicates that the open-water aquatic life subuse is not met. This impairment will be addressed by the completed TMDL for the Chesapeake Bay watershed.

2. Does this facility discharge to a stream segment on the 303(d) list? If yes, please fill out Table A.

Yes.

Table A. 303(d) Impairment and TMDL information for the receiving stream segment

Waterbody Name	Impaired Use	Cause	TMDL completed	WLA	Basis for WLA	TMDL Schedule
Impairment Information in the 2012 Integrated Report						
Rappahannock River*	Recreation	*E. coli*	Tidal Rappahannock Bacteria 5/5/2008	2.26E+13 cfu/year E. coli	126 cfu/100ml *E. coli* --- 13 MGD	N/A
	Fish Consumption	PCBs	No	--	--	2016

* Please note that in the Draft 2014 Integrated Assessment, the tidal Rappahannock River is listed with a dissolved oxygen impairment for the aquatic life use and open water aquatic life subuse. The dissolved oxygen impairment will be covered by the completed TMDL for the Chesapeake Bay watershed; however, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

3. Are there any downstream 303(d) listed impairments that are relevant to this discharge? If yes, please fill out Table B.

No.

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

The tidal Rappahannock River is listed with a PCB impairment. This facility conducted PCB monitoring during the last permit cycle in support of the development of a PCB TMDL. The PCB monitoring data will be evaluated and source reductions through a pollution minimization plan may be needed.

5. Fact Sheet Requirements – Please provide information regarding any drinking water intakes located within a 5 mile radius of the discharge point.

There are no public water supply intakes located within 5 miles of this discharge.

6. Please provide the specifications for the drainage area at the outfall.

The drainage area at the outfall is 1649 mi^2.

Dissolved Oxygen Criteria (9 VAC 25-260-185)

Designated Use	Criteria Concentration/Duration	Temporal Application
Migratory fish spawning and nursery	7-day mean > 6 mg/L (tidal habitats with 0-0.5 ppt salinity)	February 1 – May 31
	Instantaneous minimum > 5 mg/L	
Open-water[1,2]	30-day mean > 5.5 mg/L (tidal habitats with 0-0.5 ppt salinity) 30-day mean > 5 mg/L (tidal habitats with >0.5 ppt salinity)	Year-round
	7-day mean > 4 mg/L	
	Instantaneous minimum > 3.2 mg/L at temperatures < 29°C Instantaneous minimum > 4.3 mg/L at temperatures > 29°C	
Deep-water	30-day mean >3 mg/L	June 1-September 30
	1-day mean > 2.3 mg/L	
	Instantaneous minimum > 1.7 mg/L	
Deep-channel	Instantaneous minimum > 1 mg/L	June 1-September 30

[1]See subsection aa of 9 VAC 25-260-310 for site specific seasonal open-water dissolved oxygen criteria applicable to the tidal Mattaponi and Pamunkey Rivers and their tidal tributaries.

[2]In applying this open-water instantaneous criterion to the Chesapeake Bay and its tidal tributaries where the existing water quality for dissolved oxygen exceeds an instantaneous minimum of 3.2 mg/L, that higher water quality for dissolved oxygen shall be provided antidegradation protection in accordance with section 30 subsection A.2 of the Water Quality Standards.

pH/Temp Field Data for DEQ Monitoring Station 3-RPP104.47
March 2004 -- December 2009

Collection Date	Temp (°C)	pH (S.U.)
15-Mar-04	8.88	8.26
6-May-04	16.22	6.94
17-Nov-04	7.66	6.94
12-Jan-05	6.83	7.14
24-Mar-05	9.15	7.17
12-May-05	22.56	8.71
7-Jul-05	28.4	7.17
6-Sep-05	26.4	7.3
1-Nov-05	11.7	7.38
4-Jan-06	5.4	7.38
8-Mar-06	8.1	7.7
5-Apr-06	15.2	7.3
20-Jun-06	27.7	6.9
9-Aug-06	30.3	7.1
11-Oct-06	16.9	7.2
12-Dec-06	3.3	7.3
11-Apr-07	10.7	7.9
6-Jun-07	26.2	7.1
8-Aug-07	30	7
10-Oct-07	24.7	6.9
11-Dec-07	5.3	7
12-Feb-08	4.6	7
8-Apr-08	10.8	7
10-Jun-08	29.9	7.2
12-Aug-08	26.5	7.6
15-Oct-08	19.9	7.3
18-Dec-08	6.7	7
10-Feb-09	5.1	7.1
16-Apr-09	11.8	7.2
16-Jun-09	25	7.3
20-Oct-09	11.5	7.1
3-Dec-09	9	7.3
90th Percentile	**28.33**	**7.69**

Attachment 9

Assume 2:1 Dilution

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Little Falls Run WWTP for all other parameters Permit No.: VA0076392

Receiving Stream: Rappahannock River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO3) =	50 mg/L	1Q10 (Annual) =	1 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO3) =	50 mg/L
90% Temperature (Annual) =	27.5 deg C	7Q10 (Annual) =	1 MGD	- 7Q10 Mix =	100 %	90% Temp (Annual) =	27.5 deg C
90% Temperature (Wet season) =	15 deg C	30Q10 (Annual) =	1 MGD	- 30Q10 Mix =	100 %	90% Temp (Wet season) =	deg C
90% Maximum pH =	7.5 SU	1Q10 (Wet season) =	1 MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	7.5 SU
10% Maximum pH =	SU	30Q10 (Wet season)	1 MGD	- 30Q10 Mix =	100 %	10% Maximum pH =	SU
Tier Designation (1 or 2) =	1	30Q5 =	1 MGD			Discharge Flow =	1 MGD
Public Water Supply (PWS) Y/N? =	n	Harmonic Mean =	1 MGD				
Trout Present Y/N? =	n						
Early Life Stages Present Y/N? =	y						

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	na	9.9E+02	--	--	na	2.0E+03	--	--	--	--	--	--	--	--	--	--	na	**2.0E+03**
Acrolein	0	--	--	na	9.3E+00	--	--	na	1.9E+01	--	--	--	--	--	--	--	--	--	--	na	**1.9E+01**
Acrylonitrile [C]	0	--	--	na	2.5E+00	--	--	na	5.0E+00	--	--	--	--	--	--	--	--	--	--	na	**5.0E+00**
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	6.0E+00	--	na	1.0E-03	--	--	--	--	--	--	--	--	**6.0E+00**	--	na	**1.0E-03**
Ammonia-N (mg/l) (Yearly)	0	1.99E+01	1.89E+00	na	--	4.0E+01	3.8E+00	na	--	--	--	--	--	--	--	--	--	**4.0E+01**	**3.8E+00**	na	--
Ammonia-N (mg/l) (High Flow)	0	1.99E+01	4.36E+00	na	--	4.0E+01	8.7E+00	na	--	--	--	--	--	--	--	--	--	**4.0E+01**	**8.7E+00**	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	8.0E+04	--	--	--	--	--	--	--	--	--	--	na	**8.0E+04**
Antimony	0	--	--	na	6.4E+02	--	--	na	1.3E+03	--	--	--	--	--	--	--	--	--	--	na	**1.3E+03**
Arsenic	0	3.4E+02	1.5E+02	na	--	6.8E+02	3.0E+02	na	--	--	--	--	--	--	--	--	--	**6.8E+02**	**3.0E+02**	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	1.0E+03	--	--	--	--	--	--	--	--	--	--	na	**1.0E+03**
Benzidine [C]	0	--	--	na	2.0E-03	--	--	na	4.0E-03	--	--	--	--	--	--	--	--	--	--	na	**4.0E-03**
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	3.6E-01	--	--	--	--	--	--	--	--	--	--	na	**3.6E-01**
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	3.6E-01	--	--	--	--	--	--	--	--	--	--	na	**3.6E-01**
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	3.6E-01	--	--	--	--	--	--	--	--	--	--	na	**3.6E-01**
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	3.6E-01	--	--	--	--	--	--	--	--	--	--	na	**3.6E-01**
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	1.1E+01	--	--	--	--	--	--	--	--	--	--	na	**1.1E+01**
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	1.3E+05	--	--	--	--	--	--	--	--	--	--	na	**1.3E+05**
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	4.4E+01	--	--	--	--	--	--	--	--	--	--	na	**4.4E+01**
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	2.8E+03	--	--	--	--	--	--	--	--	--	--	na	**2.8E+03**
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	3.8E+03	--	--	--	--	--	--	--	--	--	--	na	**3.8E+03**
Cadmium	0	1.8E+00	6.6E-01	na	--	3.6E+00	1.3E+00	na	--	--	--	--	--	--	--	--	--	**3.6E+00**	**1.3E+00**	na	--
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	3.2E+01	--	--	--	--	--	--	--	--	--	--	na	**3.2E+01**
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	4.8E+00	8.6E-03	na	1.6E-02	--	--	--	--	--	--	--	--	**4.8E+00**	**8.6E-03**	na	**1.6E-02**
Chloride	0	8.6E+05	2.3E+05	na	--	1.7E+06	4.6E+05	na	--	--	--	--	--	--	--	--	--	**1.7E+06**	**4.6E+05**	na	--
TRC	0	1.9E+01	1.1E+01	na	--	3.8E+01	2.2E+01	na	--	--	--	--	--	--	--	--	--	**3.8E+01**	**2.2E+01**	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	3.2E+03	--	--	--	--	--	--	--	--	--	--	na	**3.2E+03**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	2.6E+02	--	--	--	--	--	--	--	--	--	--	na	2.6E+02
Chloroform	0	--	--	na	1.1E+04	--	--	na	2.2E+04	--	--	--	--	--	--	--	--	--	--	na	2.2E+04
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	3.2E+03	--	--	--	--	--	--	--	--	--	--	na	3.2E+03
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	3.0E+02	--	--	--	--	--	--	--	--	--	--	na	3.0E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	1.7E-01	8.2E-02	na	--	--	--	--	--	--	--	--	--	1.7E-01	8.2E-02	na	--
Chromium III	0	3.2E+02	4.2E+01	na	--	6.5E+02	8.4E+01	na	--	--	--	--	--	--	--	--	--	6.5E+02	8.4E+01	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	3.2E+01	2.2E+01	na	--	--	--	--	--	--	--	--	--	3.2E+01	2.2E+01	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	3.6E-02	--	--	--	--	--	--	--	--	--	--	na	3.6E-02
Copper	0	7.0E+00	5.0E+00	na	--	1.4E+01	9.9E+00	na	--	--	--	--	--	--	--	--	--	1.4E+01	9.9E+00	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	4.4E+01	1.0E+01	na	3.2E+04	--	--	--	--	--	--	--	--	4.4E+01	1.0E+01	na	3.2E+04
DDD [C]	0	--	--	na	3.1E-03	--	--	na	6.2E-03	--	--	--	--	--	--	--	--	--	--	na	6.2E-03
DDE [C]	0	--	--	na	2.2E-03	--	--	na	4.4E-03	--	--	--	--	--	--	--	--	--	--	na	4.4E-03
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	2.2E+00	2.0E-03	na	4.4E-03	--	--	--	--	--	--	--	--	2.2E+00	2.0E-03	na	4.4E-03
Demeton	0	--	1.0E-01	na	--	--	2.0E-01	na	--	--	--	--	--	--	--	--	--	--	2.0E-01	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	3.4E-01	3.4E-01	na	--	--	--	--	--	--	--	--	--	3.4E-01	3.4E-01	na	--
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	3.6E-01	--	--	--	--	--	--	--	--	--	--	na	3.6E-01
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	2.6E+03	--	--	--	--	--	--	--	--	--	--	na	2.6E+03
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	1.9E+03	--	--	--	--	--	--	--	--	--	--	na	1.9E+03
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	3.8E+02	--	--	--	--	--	--	--	--	--	--	na	3.8E+02
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	5.6E-01	--	--	--	--	--	--	--	--	--	--	na	5.6E-01
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	3.4E+02	--	--	--	--	--	--	--	--	--	--	na	3.4E+02
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	7.4E+02	--	--	--	--	--	--	--	--	--	--	na	7.4E+02
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	1.4E+04	--	--	--	--	--	--	--	--	--	--	na	1.4E+04
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	2.0E+04	--	--	--	--	--	--	--	--	--	--	na	2.0E+04
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	5.8E+02	--	--	--	--	--	--	--	--	--	--	na	5.8E+02
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	3.0E+02	--	--	--	--	--	--	--	--	--	--	na	3.0E+02
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	4.2E+02	--	--	--	--	--	--	--	--	--	--	na	4.2E+02
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	4.8E-01	1.1E-01	na	1.1E-03	--	--	--	--	--	--	--	--	4.8E-01	1.1E-01	na	1.1E-03
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	8.8E+04	--	--	--	--	--	--	--	--	--	--	na	8.8E+04
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	1.7E+03	--	--	--	--	--	--	--	--	--	--	na	1.7E+03
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	2.2E+06	--	--	--	--	--	--	--	--	--	--	na	2.2E+06
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	9.0E+03	--	--	--	--	--	--	--	--	--	--	na	9.0E+03
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+04
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	5.6E+02	--	--	--	--	--	--	--	--	--	--	na	5.6E+02
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	6.8E+01	--	--	--	--	--	--	--	--	--	--	na	6.8E+01
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	1.0E-07	--	--	--	--	--	--	--	--	--	--	na	1.0E-07
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	4.0E+00	--	--	--	--	--	--	--	--	--	--	na	4.0E+00
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	4.4E-01	1.1E-01	na	1.8E+02	--	--	--	--	--	--	--	--	4.4E-01	1.1E-01	na	1.8E+02
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	4.4E-01	1.1E-01	na	1.8E+02	--	--	--	--	--	--	--	--	4.4E-01	1.1E-01	na	1.8E+02
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	4.4E-01	1.1E-01	--	--	--	--	--	--	--	--	--	--	4.4E-01	1.1E-01	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	1.8E+02	--	--	--	--	--	--	--	--	--	--	na	1.8E+02
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	1.7E-01	7.2E-02	na	1.2E-01	--	--	--	--	--	--	--	--	1.7E-01	7.2E-02	na	1.2E-01
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	6.0E-01	--	--	--	--	--	--	--	--	--	--	na	6.0E-01

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	4.2E+03	--	--	--	--	--	--	--	--	--	--	na	4.2E+03
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	2.8E+02	--	--	--	--	--	--	--	--	--	--	na	2.8E+02
Fluorene	0	--	--	na	5.3E+03	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+04
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	2.0E-02	na	--	--	--	--	--	--	--	--	--	--	2.0E-02	na	--
Heptachlor [c]	0	5.2E-01	3.8E-03	na	7.9E-04	1.0E+00	7.6E-03	na	1.6E-03	--	--	--	--	--	--	--	--	1.0E+00	7.6E-03	na	1.6E-03
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	na	3.9E-04	1.0E+00	7.6E-03	na	7.8E-04	--	--	--	--	--	--	--	--	1.0E+00	7.6E-03	na	7.8E-04
Hexachlorobenzene[c]	0	--	--	na	2.9E-03	--	--	na	5.8E-03	--	--	--	--	--	--	--	--	--	--	na	5.8E-03
Hexachlorobutadiene[c]	0	--	--	na	1.8E+02	--	--	na	3.6E+02	--	--	--	--	--	--	--	--	--	--	na	3.6E+02
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	na	4.9E-02	--	--	na	9.8E-02	--	--	--	--	--	--	--	--	--	--	na	9.8E-02
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	na	1.7E-01	--	--	na	3.4E-01	--	--	--	--	--	--	--	--	--	--	na	3.4E-01
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	na	na	1.8E+00	1.9E+00	--	na	3.6E+00	--	--	--	--	--	--	--	--	1.9E+00	--	na	3.6E+00
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	2.2E+03	--	--	--	--	--	--	--	--	--	--	na	2.2E+03
Hexachloroethane[c]	0	--	--	na	3.3E+01	--	--	na	6.6E+01	--	--	--	--	--	--	--	--	--	--	na	6.6E+01
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	4.0E+00	na	--	--	--	--	--	--	--	--	--	--	4.0E+00	na	--
Indeno (1,2,3-cd) pyrene [c]	0	--	--	na	1.8E-01	--	--	na	3.6E-01	--	--	--	--	--	--	--	--	--	--	na	3.6E-01
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone[c]	0	--	--	na	9.6E+03	--	--	na	1.9E+04	--	--	--	--	--	--	--	--	--	--	na	1.9E+04
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	4.9E+01	5.6E+00	na	--	9.8E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	9.8E+01	1.1E+01	na	--
Malathion	0	--	1.0E-01	na	--	--	2.0E-01	na	--	--	--	--	--	--	--	--	--	--	2.0E-01	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	--	--	2.8E+00	1.5E+00	--	--	--	--	--	--	--	--	--	--	2.8E+00	1.5E+00	--	--
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	3.0E+03	--	--	--	--	--	--	--	--	--	--	na	3.0E+03
Methylene Chloride [c]	0	--	--	na	5.9E+03	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	--	--	na	1.2E+04
Methoxychlor	0	--	3.0E-02	na	--	--	6.0E-02	na	--	--	--	--	--	--	--	--	--	--	6.0E-02	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Nickel	0	1.0E+02	1.1E+01	na	4.6E+03	2.0E+02	2.3E+01	na	9.2E+03	--	--	--	--	--	--	--	--	2.0E+02	2.3E+01	na	9.2E+03
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	1.4E+03	--	--	--	--	--	--	--	--	--	--	na	1.4E+03
N-Nitrosodimethylamine[c]	0	--	--	na	3.0E+01	--	--	na	6.0E+01	--	--	--	--	--	--	--	--	--	--	na	6.0E+01
N-Nitrosodiphenylamine[c]	0	--	--	na	6.0E+01	--	--	na	1.2E+02	--	--	--	--	--	--	--	--	--	--	na	1.2E+02
N-Nitrosodi-n-propylamine[c]	0	--	--	na	5.1E+00	--	--	na	1.0E+01	--	--	--	--	--	--	--	--	--	--	na	1.0E+01
Nonylphenol	0	2.8E+01	6.6E+00	--	--	5.6E+01	1.3E+01	na	--	--	--	--	--	--	--	--	--	5.6E+01	1.3E+01	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	1.3E-01	2.6E-02	na	--	--	--	--	--	--	--	--	--	1.3E-01	2.6E-02	na	--
PCB Total[c]	0	--	1.4E-02	na	6.4E-04	--	2.8E-02	na	1.3E-03	--	--	--	--	--	--	--	--	--	2.8E-02	na	1.3E-03
Pentachlorophenol [c]	0	7.7E-03	5.9E-03	na	3.0E+01	1.5E-02	1.2E-02	na	6.0E+01	--	--	--	--	--	--	--	--	1.5E-02	1.2E-02	na	6.0E+01
Phenol	0	--	--	na	8.6E+05	--	--	na	1.7E+06	--	--	--	--	--	--	--	--	--	--	na	1.7E+06
Pyrene	0	--	--	na	4.0E+03	--	--	na	8.0E+03	--	--	--	--	--	--	--	--	--	--	na	8.0E+03
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	8.0E+00	--	--	--	--	--	--	--	--	--	--	na	8.0E+00
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	4.0E+01	1.0E+01	na	8.4E+03	--	--	--	--	--	--	--	--	**4.0E+01**	**1.0E+01**	**na**	**8.4E+03**
Silver	0	1.0E+00	--	na	--	2.1E+00	--	na	--	--	--	--	--	--	--	--	--	**2.1E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	8.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.0E+01**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	6.6E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.6E+01**
Thallium	0	--	--	na	4.7E-01	--	--	na	9.4E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**9.4E-01**
Toluene	0	--	--	na	6.0E+03	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+04**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	1.5E+00	4.0E-04	na	5.6E-03	--	--	--	--	--	--	--	--	**1.5E+00**	**4.0E-04**	**na**	**5.6E-03**
Tributyltin	0	4.6E-01	7.2E-02	na	--	9.2E-01	1.4E-01	na	--	--	--	--	--	--	--	--	--	**9.2E-01**	**1.4E-01**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	1.4E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.4E+02**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	3.2E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.2E+02**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	6.0E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.0E+02**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	4.8E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.8E+01**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	4.8E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.8E+01**
Zinc	0	6.5E+01	6.6E+01	na	2.6E+04	1.3E+02	1.3E+02	na	5.2E+04	--	--	--	--	--	--	--	--	**1.3E+02**	**1.3E+02**	**na**	**5.2E+04**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	1.3E+03
Arsenic	1.8E+02
Barium	na
Cadmium	7.9E-01
Chromium III	5.0E+01
Chromium VI	1.3E+01
Copper	5.6E+00
Iron	na
Lead	6.7E+00
Manganese	na
Mercury	9.2E-01
Nickel	1.4E+01
Selenium	6.0E+00
Silver	8.4E-01
Zinc	5.2E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

March 2010
MEMORANDUM

Attachment 11

TO: Virginia Institute of Marine Science (VIMS) Model for the Tidal Rappahannock File

FROM: Alison Thompson, Water Permitting -- NRO

SUBJECT: Virginia Institute of Marine Science Model for the Tidal Rappahannock. Input Assumptions and Summaries through December 2009

This memo summarizes all of the VIMS model inputs, assumptions, and results made to date, documenting the use of and decisions reached with the model.

The last major update to the inputs to the model was dated January 2005. It was the model run for the expansion of the Little Falls Run STP from 8.0 MGD to 13.0 MGD. In addition, staff made changes to the VIMS point source inputs due to the regulatory initiatives regarding nutrient loadings to the Chesapeake Bay. This analysis accounted for the status of the nutrient regulations in January 2005. In August 2006, staff did a correction to the model for the Fredericksburg STP flow used for the nutrient loadings. The most recent work, and the basis for this memorandum, was done because DEQ received a modification request from Spotsylvania County to move 1.4 MGD flow from FMC to the Massaponax STP.

Background

Stafford County, Spotsylvania County, and the City of Fredericksburg funded a water quality model for the upper Rappahannock River estuary developed by the Virginia Institute of Marine Science (VIMS), entitled A Modeling Study of the Water Quality of the Upper Rappahannock River (VIMS Model). This model was approved by the State Water Control Board Director on December 6, 1991. This model is used to determine effluent limitations for new and expanded discharge requests in the upper Rappahannock River, from the fall line at Fredericksburg to the Rt. 301 Bridge in King George County. VIMS documentation of the model is contained in *A Modeling Study of the Water Quality of the Upper Rappahannock River*, October 1991. A copy of the report as well as the program and general correspondence is contained in the Department of Environmental Quality (DEQ) Northern Regional Office (NRO) Rappahannock Model File.

There are 32 river miles between the fall line and the Rt. 301 Bridge. The model divides this 32 mile segment of the river into 33 model segments (see Figure 1 for discharger locations). The following point source discharges are included in the current model run:

Segment 3:	Fredericksburg STP	VA0025127	4.5 MGD
Segment 4:	FMC WWTP	VA0068110	4.0 MGD
Segment 9:	Little Falls Run STP	VA0076392	13.0 MGD
	Massaponax STP	VA0025658	9.4 MGD
Segment 20:	Four Winds Campground	VA0060429	0.210 MGD
Segment 23:	Hopyard Farm WWTP	VA0089338	0.50 MGD
Segment 26:	Haymount STP	VA0089125	0.96 MGD

Regulations affecting the VIMS model inputs

The 2008 303(d)/305(b) Integrated Report (2008 IR) indicates that the tidal, freshwater portion of the Rappahannock River (which encompasses the entire extent of this model) is impaired for not meeting the aquatic life use due to low levels of dissolved oxygen. Specifically, an open water assessment of dissolved oxygen values during the summer season showed that the tidal, freshwater Rappahannock River (RPPTF) does not meet water quality standards. The total maximum daily load (TMDL) for this impairment is due by 2010, as part of the Chesapeake Bay-wide TMDL to address excess nutrients and sediment affecting the Bay.

In addition, the 2008 IR also listed the tidal, freshwater Rappahannock River as impaired for not meeting the fish consumption use, due to elevated levels of Polychlorinated Biphenyls (PCBs) in fish tissue. The Virginia Department of Health issued a fish

consumption advisory for the Rappahannock River below the fall line that limits American eel, blue catfish, carp, channel catfish, croaker, gizzard shad, and anadromous (coastal) striped bass consumption to no more than two meals per month. The affected area extends from the I-95 bridge above Fredericksburg downstream to the mouth of the river near Stingray Point, including its tributaries Hazel Run up to the I-95 bridge crossing and Claiborne Run up to the Route 1 bridge crossing. The TMDL study for this impairment is due by 2016.

Finally, the tidal, freshwater Rappahannock River, from the Route 1 bridge in Fredericksburg, downstream to the confluence with Mill Creek (near the Route 301 bridge crossing) is listed as impaired for not supporting the recreational use due to exceedances of the *E. coli* bacteria criterion. A TMDL was developed for the bacteria impairment in 2007-2008. The TMDL was approved by EPA on 05/05/2008.

As of the drafting of this memo, the preliminary 2010 303(d)/305(b) Integrated Assessment indicates that the open-water aquatic life sub-use (assessed using dissolved oxygen data) for the tidal, freshwater Rappahannock River is fully supporting. There is insufficient information to determine if the aquatic life sub-use for migratory fish spawning and nursery is being met; thus, the overall aquatic life use is also listed as having insufficient information to make an assessment.

Virginia has committed to protecting and restoring the Bay and its tributaries. Currently the Agency has developed nutrient water quality standards for the Bay and its tributaries, amended the Nutrient Policy (9 VAC 25-40-10) to govern the inclusion of technology-based, numerical nitrogen and phosphorus limits in VPDES permits, and a parallel effort updating and amending the Water Quality Management Planning (WQMP) regulation 9 VAC 25-720. The Water Quality Standards for the Bay were adopted in March 2005. The WQMP regulation includes Total Nitrogen and Total Phosphorus Wasteload Allocations for all Chesapeake Bay Program Significant Discharge List (CBP SDL) discharges.

The total phosphorous loadings based on the Nutrient Policy and/or from the WQMP for the applicable facilities are as follows:

Fredericksburg STP (4.5 MGD; 0.3 mg/L)	4,111 lb/year
FMC WWTP (5.4 MGD; 0.3 mg/L)	4,934 lb/year
Little Falls Run STP (8.0 MGD; 0.3 mg/L)	7,309 lb/year
Massaponax STP (8.0 MGD; 0.3 mg/L)	7,309 lb/year
Four Winds Campground (0.21 MGD)	640 lb/year. Not in the WQMP, but must meet 1.0 mg/L annual average
Haymount STP (0.96 MGD; 0.3 mg/L)	877 lb/year
Hopyard Farm WWTP (0.5 MGD; 0.3 mg/L)	457 lb/year

The total nitrogen loadings based on the Nutrient Policy and from the WQMP for the applicable facilities are as follows:

Fredericksburg STP (4.5 MGD; 4.0 mg/L)	54,819 lb/year
FMC WWTP (5.4 MGD; 4.0 mg/L)	65,784 lb/year
Little Falls Run STP (8.0 MGD; 4.0 mg/L)	97,458 lb/year
Massaponax STP (8.0 MGD; 4.0 mg/L)	97,458 lb/year
Four Winds Campground (0.21 MGD)	5100 lb/year. Not in the WQMP, but must meet 8.0 mg/L annual average
Haymount STP (0.96 MGD; 4.0 mg/L)	11,695 lb/year
Hopyard Farm WWTP (0.5 MGD; 4.0 mg/L)	6091 lb/year.

In addition to the nutrient initiatives, the changes to the Water Quality Standards for the Chesapeake Bay and tidal waters included criteria for dissolved oxygen, water clarity, chlorophyll a, and Designated Uses. The dissolved oxygen standard for

migratory fish waters for the months of February through May is a 7-day mean of greater than of 6.0 mg/L. For the months of June through January, the minimum is 5.5 mg/L. These dissolved oxygen criteria apply to the upper tidal portion of the Rappahannock River.

RADCO 208 Plan

The Rappahannock Area Development Commission (RADCO) 208 Area Waste Treatment Management Plan was adopted in August 1977, was amended in September 1983, and was repealed in 2004. The loading allocations in it had to be maintained until the Plan was repealed. The loading allocations in the Plan were based on an old water quality model, AUTO$$, that was replaced in 1991 by the VIMS model.

The VIMS model has demonstrated that nutrients are the primary factor affecting water quality in the upper tidal Rappahannock River. Numerous runs of the model have demonstrated that cBOD is not as influential as the nutrients at the maximum permitted flows of each POTW. As such, cBOD loadings are permissible above the levels specified in the old RADCO Plan.

Model Timeline

To date the model has been run seven times, each being necessitated by a request for a flow increase or for a new discharge. The runs are as follows:

1. August 14, 1995	- expansion of Fredericksburg STP from 3.5 to 4.5 MGD - addition of 0.93 MGD Haymount STP in Caroline County
2. August 22, 1996	- addition of 0.25 MGD Hopyard Farm WWTP in King George County
3. March 17, 1997	- flow increase and production increase at White Packing
4. April 7, 1999	- expansion of Little Falls Run STP from 4.0 to 8.0 MGD - expansion of Massaponax STP from 6.0 to 8.0 MGD
5. December 1, 2000	- expansion of FMC WWTP from 4.0 to 5.4 MGD
6. April 29, 2003	- expansion of the proposed Hopyard Farm WWTP from 0.25 to 0.50 MGD.
7. January 26, 2005	-remove White Packing from Segment 26 since the facility is closed -correction of Haymount STP flow to 0.96 (previously was 0.93) -addition of 1.0-MGD Greenhost – Village Farms in King George County -expansion of Little Falls Run STP from 8.0 to 13.0 MGD -incorporation of the WQMP nutrient loadings for the Significant Dischargers
8. August 2006	- correct nutrient loadings for the City of Fredericksburg
9. December 2009	- shift 1.4 MGD flow from FMC to Massaponax (will now be 9.4 MGD) - change the distribution of the nitrogen species based on the data obtained from the Discharge Monitoring Reports.

The initial run on August 14, 1995, has been considered the background condition for the river segments. The VIMS files located at DEQ-NRO contain the supporting documentation for the original model inputs and the subsequent model runs. With each successive run of the model, all parameters had been kept constant except those affected by the request necessitating the model run. The most recent model runs affected a change to the nutrient loadings for all the dischargers. In the older model runs, staff used best professional judgment to determine the distribution of the three nitrogen species: Ammonia as Nitrogen, Total Kjeldahl Nitrogen, and Oxidized Nitrogen (Nitrate+Nitrite). The January 2010 run looked at actual performance data from the four largest facilities and found that the old assumptions were not correct. The old assumptions were Ammonia as Nitrogen (25%), Total Kjeldahl Nitrogen (25%), and Oxidized Nitrogen (50%). The actual performance data from these larger facilities is Ammonia as Nitrogen (3%), Total Kjeldahl Nitrogen (37%), and Oxidized Nitrogen (60%).

Antidegradation Analysis

With each running of the model, and/or permit action concerning this section of the Rappahannock River, an antidegradation analysis has been conducted in accordance with the water quality standards and DEQ guidance. This is a difficult task since the assessment and designation of Tier I or Tier II waters is partially subjective given the narrative criteria of the standards, water quality data are not static, and waterbody boundaries are not well defined.

Since the onset of using this model, the established model segments have been used, by default, to define river sections into individual waterbodies for the antidegradation analysis. DEQ did not suggest or contend that these model segments should be used for other water quality management purposes. It was recognized that the river from the fall line down to the Rt. 301 Bridge could have been, and perhaps should have been, considered one waterbody segment. DEQ also acknowledged that this whole segment of the Rappahannock River could have been assessed as Tier I since it is considered nutrient enriched and turbid and therefore subject to corrective plans outlined in the *1999 Tributary Strategy for the Rappahannock River and Northern Neck Coastal Basins*. However, being uncertain DEQ elected to evaluate antidegradation, as through each of the model segments were actual distinct waterbodies. This approach was conservative in terms of protecting water quality and to date did not prove to be an undo burden to any of the dischargers.

Historically, four segments were identified as Tier II through this process: segment 16, segment 20, segment 23, and segment 26. Each was identified through separate permit actions that did not initially involve the VIMS model. When a segment was analyzed as Tier II, two parameters generally were assessed, ammonia and dissolved oxygen (DO). Ammonia levels were kept below the baselines and DO was kept to no lower than 0.2 mg/L of the concentration predicted in the August 14, 1995 background model run. The VIMS memo dated April 29, 2003 contains the historical summary and table of the baselines of the Tier determinations for each of the four segments.

During the January 2005 model run analysis, the entire Rappahannock River was determined to be Tier I. The previous determination of Tier II ratings for segments 16, 20, 23, and 26 were made with adherence to guidance with little best professional judgement by staff. It has been 10 years since the initial runs of the model and staff no longer believes it appropriate to assign a tier rating for each model segment. Staff believes it is best to rate the whole segment from the fall line to the Route 301 bridge as one segment. The nutrient enrichment problems of this segment, as evident by high turbidity, warrant a Tier I rating. Staff again makes this determination for the sole purpose of assigning permit limits. And since the Tier ratings have had very little influence on the results of the model, there is no measurable consequence to this change, and there is no need to continue to assess these segments (16, 20, 23, and 26) as being different from the whole river segment.

It should be noted that the predicted concentrations of dissolved oxygen and ammonia are significantly different in this current model run than what was considered the "background" concentrations. With the new loading allocations to the significant discharges in place, the model predicts that chlorophyll concentrations will be significantly less than what prior model runs have predicted and the artificially elevated levels of dissolved oxygen (nutrients stimulate chlorophyll growth and chlorophyll photosynthesis generates dissolved oxygen) are no longer predicted. Further discussion of chlorophyll a is found in the next section.

Total Phosphorus Loading Cap (historical perspective)

All of the above facilities discharge into the tidal freshwater Rappahannock River. This section of the river was formerly designated as nutrient enriched waters. Specifically, the Tidal freshwater Rappahannock River from the fall line to Buoy 44 near Leedstown, Virginia, including all tributaries to their headwaters that enter the tidal freshwater Rappahannock River were classified as nutrient enriched waters. All dischargers into nutrient enriched waters as designated in the Water Quality Standards for Nutrient Enriched Waters that were permitted before July 1, 1988, and that discharge 1 MGD or more were subject to the Policy for Nutrient Enriched Waters. This policy required facilities to meet a monthly average Total Phosphorus limitations of 2.0 mg/L and to monitor for monthly average Total Nitrogen concentration and loading values. The application of standards to protect nutrient enriched waters within the Chesapeake Bay watershed was replaced in Virginia by the aforementioned regulatory programs governing nutrient and sediment inputs into the Bay. Thus, the nutrient enriched waters designation was removed from the Water Quality Standards.

Based on the prior VIMS model runs, the chlorophyll a levels in the upper segments of the river in the Fredericksburg area approached 100 ug/L under design conditions. It is staff's best professional judgment that high chlorophyll a concentrations and the corresponding high alga growth mask dissolved oxygen depletion due to BOD loading. The model provides a 30-day average output and it is hypothesized that the elevating effect of the chlorophyll concentrations is more significant than the depleting effect of the BOD loadings. If the model provided daily outputs, one could see the diurnal dissolved oxygen sag and

super-saturation effects in an over-enriched system. Further, the model demonstrated that chlorophyll a concentrations increased with additional phosphorus (P) loadings. If P limits for the expanding STPs were based solely on the Nutrient Policy, 2 mg/L, then chlorophyll a levels would exceed 120 ug/L in the waters around the City of Fredericksburg. To prevent further increases in chlorophyll a concentrations in this part of the river, total phosphorus loadings (mass based, kg/day) were not allowed to increase for the Fredericksburg, FMC, Massaponax, and Little Falls Run wastewater treatment plants beyond the current limits. All future requests for flow increases at these facilities required that the P mass limits remain constant at the current loading limits. Permitted phosphorus concentration limits may remain at the same level prescribed by the Nutrient Policy, 2 mg/L, since it is the total mass loading that impacts chlorophyll levels. However, as effluent flows increase, in order to meet the mass limitations, effluent concentrations had to be below the 2 mg/L limit.

The relationship of how chlorophyll photosynthesis affects dissolved oxygen levels has been explored in this model and it was worth recognizing what historical baseline/initial levels were. These values were useful in the subsequent model runs for tracking how nutrients inflated dissolved oxygen levels (nutrients stimulate chlorophyll growth and chlorophyll photosynthesis generates dissolved oxygen).

DEQ has adopted a chlorophyll a narrative standard at 9VAC25-260-185 that states, "Concentrations of chlorophyll a in free-floating microscopic aquatic plants (algae) shall not exceed levels that result in undesirable or nuisance aquatic plant life, or render tidal waters unsuitable for the propagation and growth of a balanced, indigenous population of aquatic life or otherwise result in ecologically undesirable water quality conditions such as reduced water clarity, low dissolved oxygen, food supply imbalances, proliferation of species deemed potentially harmful to aquatic life or humans or aesthetically objectionable conditions."

Summary of past model runs

In the 1995 VIMS model, the winter inputs for ammonia and organic nitrogen for all wastewater treatment plants were 14 mg/L ammonia and 14 mg/L organic nitrogen. These values represented little to no nitrification. The model indicated that there were no far field violations of the winter ammonia standards. Therefore, no winter ammonia or TKN limits were established for Fredericksburg, FMC, Massaponax, and Little Falls Run wastewater treatment plants. The acute ammonia criterion for the winter months was 12.07 mg/L. DEQ did not impose winter acute based ammonia limits on any of the treatment plants for the following reasons: the discharges are located near the fall line where tidal influences are the smallest; the net advective flow of the river dominates the tidal influence; the design flows are much smaller than the critical flows of the river; ammonia decays rather rapidly; and each of the plants were achieving varying degrees of nitrification.

During the April 7, 1999 model run, winter ammonia loading had to be lowered for Little Falls Run and Massaponax from 14 mg/L to 12 mg/L in order to meet the antidegradation baselines in segment 23 and 26. Since organic nitrogen would also decrease during the nitrification process, its input into the model was also lowered to 12 mg/L for both dischargers. During this model run, the winter ammonia loadings for FMC were also lowered to 12 mg/L to meet the antidegradation baselines of segments 16, 23, and 26. At the new flows for FMC, water quality criteria and antidegradation baselines are still protective for the summer months of May – October. Since organic nitrogen would also decrease during the nitrification process, its input into the model was also lowered to 12 mg/L for FMC. Acute based ammonia limits were imposed at the new flows for the same reasons cited above. However, since the new model inputs were lower than the acute ammonia water quality standard of 12.07 mg/L, it was certain that the acute standard was protected in the winter.

In the December 1, 2000 model run, two minor data entry problems were corrected in conjunction with the expansion of FMC to 5.4 MGD. First, in the original model documentation memorandum of August 14, 1995, the assumption was made that total effluent nitrogen levels for these types of plants would be 30 mg/L, and that it would exist in the form of organic nitrogen, ammonia, and/or inorganic nitrogen depending on the facility's ability to nitrify. This can be seen on page 1 under the section "Assumptions for nitrogen". However, the value shown for the three separate nitrogen parts add up to 32 mg/L. It was felt that this was a simple oversight at the time. Additionally, during the April 7, 1999 model run, nitrate-nitrite levels were increased to 21 mg/L and 24 mg/L for the Little Falls Run and Massaponax dischargers respectively, even though the ammonia nitrogen levels were set at 12 mg/L. Therefore, in order to maintain the original model assumptions, winter nitrate input levels were reset to 6 mg/L during this run for Little Falls Run, Massaponax, and FMC. Since the Fredericksburg inputs had not been adjusted, nor had they recently been adjusted, the original values were maintained (14 mg/L organic-N, 14 mg/L Ammonia-N, and 4 mg/L Nitrate/Nitrite). Second, the ammonia loadings for the Haymount STP were incorrectly entered as 8.61 kg/d. The correct loading was entered as 3.53 kg/d. This correction had little to no impact on the model outputs.

In the April 29, 2003, model run all numerical criteria were met and all antidegradation baselines for ammonia and DO were met except for one. In the winter run, segment 23 (Hopyard Farm) yielded a DO of 7.43 mg/L. The baseline for DO in this segment is 7.47 mg/L. In order to maintain the additional 0.04 mg/L of DO, the BOD concentrations of Hopyard Farm and the

upstream dischargers would have to be significantly reduced. DEQ did not believe this reduction was warranted since the model was run based on design capacity flows for all facilities and not just for Hopyard Farm. In addition, the DO deficit for segment 23 actually improved from 0.07 mg/L to 0.04 mg/L with the increase in Hopyard Farm's flows. Therefore, changes to the effluent limits were not necessary for such a small change in DO since the model is not that sensitive or accurate.

In January 2005, the model run was conducted to include the expansion of the Little Falls Run STP, the removal of White Packing, the correction of the Haymount STP flow, and the addition of Greenhost – Village Farms because of observed nutrient concentrations in the discharge. This model run also assumed that the Nutrient Policy and the WQMP regulation were adopted. Effluent loadings for $cBOD_5$ and Dissolved Oxygen were derived by multiplying the current concentration limits by the maximum permitted flow. For the facilities that are contained in the draft WQMP regulation, nutrient loadings were derived using the flows and loadings presented in draft regulation. For Four Winds Campground, nutrient loadings were derived using a total nitrogen concentration of 8.0 mg/L and a total phosphorus concentration of 1.0 mg/L based on the draft Nutrient Policy. For Hopyard Farm WWTP, nutrient loadings were derived using a total nitrogen concentration of 4.0 mg/L and a total phosphorus concentration of 0.3 mg/L based on what was the draft WQMP. Best professional judgement and actual effluent data were used to determine the loadings for Greenhost- Village Farms. There was a small excursion of the Migratory fish spawning an nursery dissolved oxygen concentration of $\geq$6 mg/L; the excursion was 5.6 mg/L. Staff did not change the BOD limits for the dischargers but recommended increased ambient monitoring of the upper tidal Rappahannock River.

Current Model Run Summary

The model was run for the summer (May- October) period because this is the most critical time and when potential dissolved oxygen excursions have been noted during past model analyses. Historically, no problems have been noted with chlorophyll or dissolved oxygen in the winter runs. It should be noted that before the model runs could be fully analyzed and other scenarios attempted, the computer that this model runs on began to fail. The older programming (Leahy Fortran) used for the VIMS model no longer runs on the newer computers. Therefore, additional modeling cannot be performed without updating the code of the VIMS model.

Summer continues to be the critical period for the water quality of the upper tidal freshwater Rappahannock River because stream flows are typically lower and the dischargers have a greater influence on the water quality in the river, and alga growth is higher during the warmer temperatures of the summer months.

Staff ran a baseline run for the summer with Massaponax at 8 MGD; the baseline run did have the nitrogen allocations changed to reflect actual effluent characteristics, as discussed above. Model runs were also done with Massaponax at 9.4 MGD, Massaponax at 9.4 MGD and all facilities meeting the WQMP conditions, all FMC flow moved to Massaponax, and all flow from FMC and the City of Fredericksburg moved to Massaponax.

Chlorophyll a & Nutrients

When the WQMP is fully implemented, the model predicts chlorophyll a levels to drop substantially even when all the dischargers are at full capacity. The WQMP essentially reduces and places total nitrogen and total phosphorus loading caps on the significant dischargers. By removing the WWTP nutrient food sources for the algae, alga populations fall and thus, chlorophyll a levels are reduced. As noted earlier in this memorandum, staff also reallocated the nitrogen species based on the performance of the upgraded facilities. This also changed the output predictions from former analyses. It is staff's best professional judgment that moving the 1.4 MGD flow from FMC to Massaponax will not have any negative effects on the chlorophyll a and nutrient concentrations in the River.

Dissolved Oxygen

Class II tidal waters in the Chesapeake Bay and it tidal tributaries must meet dissolved oxygen concentrations as specified in 9VAC25-260-185. In the Northern Virginia area, Class II waters must meet the Migratory Fish Spawning and Nursery Designated Use from February 1 through May 31. For the remainder of the year, these tidal waters must meet the Open Water use.

Designated Use	Criteria Concentration/Duration	Temporal Application
Migratory fish spawning and nursery	7-day mean > 6 mg/L (tidal habitats with 0-0.5 ppt salinity)	February 1 – May 31
	Instantaneous minimum > 5 mg/L	
Open-water[1,2]	30-day mean > 5.5 mg/L (tidal habitats with 0-0.5 ppt salinity) 30-day mean > 5 mg/L (tidal habitats with >0.5 ppt salinity)	Year-round
	7-day mean > 4 mg/L	
	Instantaneous minimum > 3.2 mg/L at temperatures < 29°C Instantaneous minimum > 4.3 mg/L at temperatures > 29°C	
	1-day mean > 2.3 mg/L	
	Instantaneous minimum > 1.7 mg/L	

[1]See subsection aa of 9 VAC 25-260-310 for site specific seasonal open-water dissolved oxygen criteria applicable to the tidal Mattaponi and Pamunkey Rivers and their tidal tributaries.

[2]In applying this open-water instantaneous criterion to the Chesapeake Bay and its tidal tributaries where the existing water quality for dissolved oxygen exceeds an instantaneous minimum of 3.2 mg/L, that higher water quality for dissolved oxygen shall be provided antidegradation protection in accordance with section 30 subsection A.2 of the Water Quality Standards.

The model results show protection of the dissolved oxygen criteria except for the month of May in several segments. The current temporal application of the dissolved oxygen standards is different than the temporal application of the model, i.e., May is classified in the summer period. The migratory fish spawning and nursery Designated Use also looks at a 7-day mean, but the model only has a 30-day output. At this time, staff does not feel any changes are necessary to the cBOD limits for the dischargers because:

1) The excursion is very small; 5.6 mg/L is the predicted concentration in segment 13 when the Massaponax flow is at 9.4 and all facilities are at the WQMP loadings and concentrations.
2) The model is not that accurate to warrant substantial changes to the STPs to achieve such a small difference in dissolved oxygen. The accuracy of the model is questionable since it was developed over 20 years ago.
3) The model assumes May to be like July, August, and September, when in fact it is not, i.e., the water temperature is cooler and the background flows are higher.

VIMS Model

Due to the age of the model and the development and changes that have occurred in the localities, staff will also inform the localities that any additional changes to design flows will require an update to the VIMS model. Staff recommends that the following be considered when the model is updated:

1) The model currently provides only a 30-day average output. It would be useful to have the ability to generate hourly, daily or other shorter averaging periods. A more refined model will allow better understanding of the relationships between DO, chlorophyll a, BOD, and nutrients.
2) Consider land use and hydrologic changes that have occurred and the associated changes to water flow, quantity and quality dynamics, especially since the Embry Dam has been removed from the River.

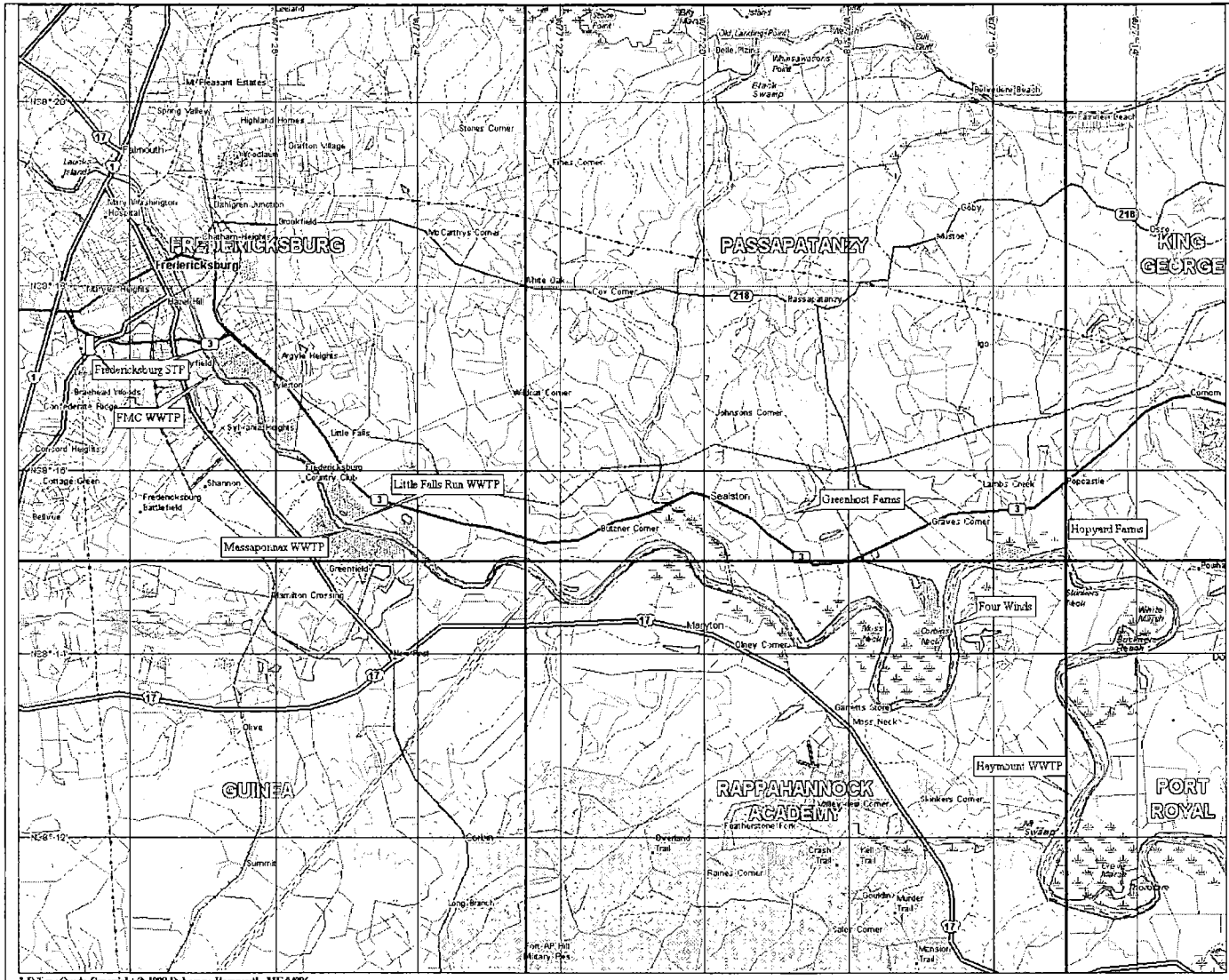


Figure 1
Discharger Locations

Table 1
Current Model Associated Limits for All Dischargers in VIMS Model

Discharger Permit No.	Fredericksburg VA0025127	FMC VA0068110	Little Falls Run VA0076392	Massaponax VA0025658	Four Winds VA0060429	Hopyard Farm VA0089338	Haymount VA0089125
Segment	3	4	9	9	20	23	26
River Mile	108.64	107.37	104.61	104.67	92.2	89.8	85.10
Flow (MGD)	4.5	5.4	13.0	9.4	0.210	0.50	0.96
BOD5 (mg/L, kg/d)	N/A	N/A	N/A	N/A	30/23.8	30/56.77	N/A
cBOD5 (mg/L, kg/d)	13.0 / 221	15.0 / 306.6	9.0 /440	10.0 / 356	N/A	N/A	10.0 / 36
TKN (summer) (mg/L, kg/d)	7.0 /119.23	3.0 / 61.3	6.0 /295	9.0 / 320	2.29/1.82	N/A	3.0 / 10.9
TKN (winter) (mg/L, kg/d)	NL	N/A	NL	NL	3.41/2.71	N/A	N/A
Ammonia (summer) (mg/L, kg/d)	N/A	N/A	4.7	N/A	N/A	10.7/20.2	N/A
Ammonia (winter) (mg/L, kg/d)	N/A	N/A	4.7	12.0 / 427	N/A	12.4/23.4	N/A
Total Phosphorous (kg/d)	26.5	30.3	30.3	45.4	1.59	3.78	7.3
Dissolved Oxygen (mg/L)	6.0	6.0	6.0	6.0	6.0	6.0	6.0

N/A – Not Applicable
NL – No Limit

4/2/2015 4:01:39 PM

Facility = Little Falls Run WWTP
Chemical = Copper
Chronic averaging period = 4
WLAa = 14
WLAc = 9.9
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 1.2
Variance = .5184
C.V. = 0.6
97th percentile daily values = 2.92010
97th percentile 4 day average = 1.99654
97th percentile 30 day average= 1.44726
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1.2

Attachment 12

4/2/2015 3:58:31 PM

Facility = Little Falls Run WWTP
Chemical = Nickel
Chronic averaging period = 4
WLAa = 200
WLAc = 23
Q.L. = 2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 6.2
Variance = 13.8384
C.V. = 0.6
97th percentile daily values = 15.0871
97th percentile 4 day average = 10.3154
97th percentile 30 day average= 7.47753
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

5.9
5.6
7.1

4/2/2015 4:03:44 PM

Facility = Little Falls Run WWTP
Chemical = Zinc
Chronic averaging period = 4
WLAa = 130
WLAc = 130
Q.L. = 10
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 3
Expected Value = 39.4666
Variance = 560.742
C.V. = 0.6
97th percentile daily values = 96.0388
97th percentile 4 day average = 65.6642
97th percentile 30 day average= 47.5989
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

39
38.4
41

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703) 583-3800 Fax (703) 583-3821
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

June 30, 2010

Stafford County
Little Falls Run STW
Re-rating Report
24855

Mr. Harry Critzer, Director
Stafford County Department of Utilities
P. O. Box 339
Stafford, VA 22555

Dear Mr. Critzer:

This department has reviewed the subject facility's re-rating report as prepared by your consultants, Parsons, Inc. Please be advised that we generally concur with the findings of this report, in that, the facility currently under nutrient removal upgrade, will be able to treat a flow of 8 MGD. It should be noted that as far as the expected TN effluent values are concerned, we have decided to assign a year round average value, of 6.0 mg/l rather than the separate summer/winter expected values of 6.1 and 5.8 mg/l, respectively, as currently reflected in the re-rating report. The expected TP value will remain at 0.3 mg/l.

This letter supersedes the department's Certificate to Construct (CTC)/approval letter of July 9, 2009, which had reflected a flow of 6 MGD. However, all conditions of approval, as well as other aspects associated with the CTC must still be adhered to.

Once construction is complete, a Statement of Completion of Construction from the licensed professional engineer who oversaw construction of the project must be submitted to this office in compliance with the requirements of 9 VAC 25-790-180.C of the Sewage Collection and Treatment (SCAT) Regulations.

We understand that our permitting staff will be contacting you separately regarding the reissuance of the VPDES permit.

Attachment 13

Should you have any questions, please feel free to contact this office.

Sincerely,

J. S. Desai, P. E.
CBP/Wastewater Engineering
Northern Regional Office

cc: Parsons –(Patrick Brooks, P. E.; Natalie Granum)
NRO – (Bryant Thomas; Alison Thompson)
CBP-CO – (Steve Raney, John Kennedy)
CAP-CO – (Jeanne Puricelli, P. E., Walter Gills)

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in the Stafford County Virginia.

PUBLIC COMMENT PERIOD: July 23, 2015 to August 24, 2015

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Stafford County Board of Supervisors
P.O. Box 339
Stafford, VA 22555
VA0076392

NAME AND ADDRESS OF FACILITY: Little Falls Run WWTF, 100 Michael Scott Lane
Fredericksburg, VA 22405

PROJECT DESCRIPTION: The Stafford County Board of Supervisors has applied for a reissuance of a permit for the public Little Falls Run Wastewater Treatment Facility. The applicant proposes to release treated sewage wastewaters from residential, commercial, and industrial areas at a rate of 13 million gallons per day into a water body. The current design flow of the facility is 8 million gallons per day. Biosolids from the treatment process will be land applied by a licensed contractor. The facility proposes to release the treated sewage into the Rappahannock River, located in Stafford County in the Rappahannock River Watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, carbonaceous-biochemical oxygen demand, total suspended solids, dissolved oxygen, Ammonia as Nitrogen, Total Kjeldahl Nitrogen, *E. coli*, Total Nitrogen, and Total Phosphorus. The facility will be required to monitor for nitrate+nitrite and whole effluent toxicity.

Additionally, the facility maintains a pretreatment program in accordance with Part VII of 9VAC25-31. The Industrial Pretreatment Plan for Continuous Industrial Waste Survey has been updated.

This facility is subject to the requirements of 9VAC25-820 and has registered for coverage under the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by hand-delivery, email, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the draft permit and application at the DEQ-Northern Regional Office by appointment or may request electronic copies of the draft permit and fact sheet.

Name: Anna Westernik
Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193
Phone: (703) 583-3837 Email: anna.westernik@deq.virginia.gov Fax: (703) 583-3821

Attachment 14

APPENDIX A
SCHEDULE OF COMPLIANCE

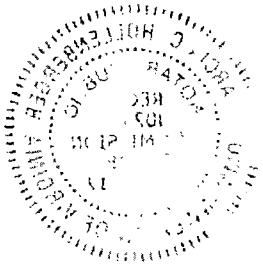
A. Corrective Action:

No later than 30 days from the execution of this Order the County shall submit an a plan and schedule for the replacement of the manhole just upstream from the blockage causing the November 2014 SSO along with the adjacent sewer lines within the Woodstream Sanitary Sewer Easement Area and TV the lines upstream outside the November 2014 SSO incident area.

B. Submissions:

Unless otherwise specified in this Order, the County shall submit all requirements of Appendix A of this Order to:

Enforcement
Virginia Department of Environmental Quality
Northern Regional Office
13901 Crown Court
Woodbridge, VA 22193



Attachment 15

Molly Joseph Ward
Secretary of Natural Resources

Clyde E. Cristman
Director

Joe Elton
Deputy Director of Operations

Rochelle Altholz
Deputy Director of Administration
and Finance

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

600 East Main Street, 24th Floor
Richmond, Virginia 23219
(804)786-6124

April 1, 2015

Susan Mackert
DEQ-NRO
13901 Crown Court
Woodbridge, VA 22193

Re: VA0076392, Little Falls Run WWTP

Dear Ms. Mackert:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the Little Falls Run Stream Conservation Unit (SCU) is located downstream from the project site. SCUs identify stream reaches that contain aquatic natural heritage resources, including 2 miles upstream and 1 mile downstream of documented occurrences, and all tributaries within this reach. SCUs are also given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain. The Little Falls Run SCU has been given a biodiversity ranking of B4, which represents a site of moderate significance. The natural heritage resource associated with this site is:

Aquatic Natural Community	G3G4/S3S4/NL/NL

The documented Aquatic Natural Community is based on Virginia Commonwealth University's **INSTAR** (*Interactive Stream Assessment Resource*) database which includes over 2,000 aquatic (stream and river) collections statewide for fish and macroinvertebrate. These data represent fish and macroinvertebrate assemblages, instream habitat, and stream health assessments. The associated Aquatic Natural Community is significant on multiple levels. First, this stream is a grade B, per the VCU-Center for Environmental Sciences (CES), indicating its relative regional significance, considering its aquatic community composition and the present-day conditions of other streams in the region. This stream reach also holds a "Healthy" stream designation per the INSTAR Virtual Stream Assessment (VSS) score. This score assesses the similarity of this stream to ideal stream conditions of biology and habitat for this region. Lastly, this stream contributes to high Biological Integrity at the watershed level (6th order) based on number of native/non-native, pollution-tolerant/intolerant and rare, threatened or endangered fish and macroinvertebrate species present.

Attachment 16

Threats to the significant Aquatic Natural Community and the surrounding watershed include water quality degradation related to point and non-point pollution, water withdrawal and introduction of non-native species. To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations, establishment/enhancement of riparian buffers with native plant species and maintaining natural stream flow.

To minimize impacts to aquatic resources, DCR supports the use of uv/ozone to replace chlorination disinfection and utilization of new technologies as they become available to improve water quality.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please re-submit project information and map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov).

Should you have any questions or concerns, feel free to contact me at (804) 692-0984. Thank you for the opportunity to comment on this project.

Sincerely,

Alli Baird

Alli Baird, LA, ASLA
Coastal Zone Locality Liaison

Westernik, Anna (DEQ)

From: ProjectReview (DGIF)
Sent: Thursday, May 14, 2015 8:54 AM
To: Westernik, Anna (DEQ)
Cc: ProjectReview (DGIF)
Subject: ESSLog 30609; DEQ VPDES re-issuance DEQ# VA-0076392 for the Little Falls Run WWTP in Fredericksburg, VA

According to our records, the Rappahannock River is designated T&E species water for the ST green floater mussel. The receiving reach of the river is tidal freshwater.

Provided adherence to the effluent characteristics and permit conditions, we do not anticipate the re-issuance of this permit to result in adverse impact to resources under our purview.

Thanks.

Ernie Aschenbach
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries
Phone: (804) 367-2733
Email: Ernie.Aschenbach@dgif.virginia.gov

We moved! Our new address is:

Physical
7870 Villa Park Dr, Suite 400
Henrico, VA 23228

Mailing
P O Box 90778
Henrico, VA 23228